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OFFICIAL GAZETTE

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December 31, 1985

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

December 31, 1985 Volume 1061 Number 5

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office has been changed as of Oct. 12, 1985 and is announced in the *Official Gazette* at 1058 O.G. 26 on Sept. 24, 1985.

International PCT fees have been changed effective Oct. 29, 1985 and were announced in the *PCT Gazette* on Aug. 29, 1985 and in the *Official Gazette* at 1058 O.G. 26 on Sept. 24, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed:	420.00
—Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority, all cases	750.00
International fees	
Basic fee (first 30 pages):	280.00
Basic Supplemental fee (for each page over 30):	6.00
Designation fee for the first 10 national or regional offices:	70.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
Oct. 21, 1985. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Board of Appeals Decisions Rendered in the Month of Nov. 1985

Affirmed	141
Affirmed in Part	19
Reversed	97
Total	257

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Dec. 28, 1982 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,365,351 through 4,366,578
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges, as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

Patent Which Expired Oct. 13, 1985, Due to Failure to Pay Maintenance Fee

Patent Number	Serial Number	Issue Date
4,294,398	06/227,542	10/13/81

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,282,790, Re. S.N. 774,092, Filed Sept. 9, 1985, Cl. 84/1.21, ELECTRONIC MUSICAL INSTRUMENT, Masatada Wachi, Owner of Record: *Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka-Ken, Japan,* Attorney or Agent: W. Robert Spensley, et al., Ex. Gp.: 217

4,412,002, Re. S.N. 791,283, Filed Oct. 25, 1985, Cl. 435/237, PROCESS FOR PREPARING HEPATITIS A VIRUS, Fred J. Bailey, et al., Owner of Record: *Calgon Corp., Pittsburgh, Pa.,* Attorney or Agent: Donald J. Perrella, et al., Ex. Gp.: 128

4,426,631, Re. S.N. 793,059, Filed Oct. 30, 1985, Cl. 333/202, CERAMIC BANDSTOP FILTER, Robert F. D'Avello, et al., Owner of Record: *Motorola, Inc., Schaumburg, Ill.,* Attorney or Agent: Edward M. Roney, et al., Ex. Gp.: 252

4,453,660, Re. S.N. 789,586, Filed Oct. 21, 1985, Cl. 226/74, FORMS FEED TRACTOR AND A METHOD OF MAKING A BELT THEREFOR, Robert W. Cornell, et al., Owner of Record: *International Business Machines Corp., Armonk, N.Y.,* Attorney or Agent: Manny W. Schecter, et al., Ex. Gp.: 242 dn,2

4,464,038, Re. S.N. 787,373, Filed Oct. 15, 1985, Cl. 354/403, DISTANCE MEASURING DEVICE FOR USE IN A CAMERA, Yasuhiro Nanba, Owner of Record: *Minolta Camera Kabushiki Kaisha, Osaka, Japan,* Attorney or Agent: V. M. Creedon, et al., Ex. Gp.: 354

4,467,590, Re. S.N. 782,754, Filed Oct. 1, 1985, Cl. 56/11.2, DRIVE REVERSING MECHANISM, Glenn A. Musser, et al., Owner of Record: *Sperry Corp., New Holland, Pa.,* Attorney or Agent: Frank A. Seemar, et al., Ex. Gp.: 333

4,488,702, Re. S.N. 06/787,671, Filed Oct. 15, 1985, Cl. 251/46, ROLLING DIHPHRAGM METERING VALUE, James M. Lapeyre, Owner of Record: *Laitram Corp., New Orleans, La.,* Attorney or Agent: James C. Kesterson, Ex. Gp.: 345

4,501,515, Re. S.N. 789,790, Filed Oct. 21, 1985, Cl. 405/259, DYNAMIC ROCK STABILIZING FIXTURE, James J. Scott, Owner of Record: *Scott Investment Partners, Rolla, Mo.,* Attorney or Agent: Frederick M. Woodruff, Ex. Gp.: 351

4,521,285, Re. S.N. 789,819, Filed Oct. 21, 1985, Cl. 204/72, ELECTROLYTIC PROCESS FOR THE PREPARATION OF ORGANIC COMPOUNDS, Paolo De Witt, Owner of Record: *Oronzio De Nora, S. A., Rome, Italy,* Attorney or Agent: Elliott I. Pollock, et al., Ex. Gp.: 112

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,885,957, Reexam. No. 90/000,905, Requested: Nov. 15, 1985, Cl. 75/58, METHOD FOR THE DESULFURIZATION OF A STEEL MELT, Helmut Richter, et al., Owner of Record: *Thyssen Stahl AG, Dusseldorf, Germany,* Attorney or Agent: Sprung, Horn, et al., Ex. Gp.: 110, Requester: Owner

3,994,539, Reexam. No. 90/000,908, Requested: Nov. 15, 1985, Cl. 308/3, SELF-CONTAINED ACTIVATED SLIDE APPARATUS AND METHODS OF CONSTRUCTING AND UTLIZING SAME, Nathan Gottlieb, Owner of Record: *Inventor, Southfield, Mich.,* Attorney or Agent: Irving M. Weiner, Ex. Gp.: 240, Requester: Birch, Stewart, et al., Falls Church, Va.

4,089,491, Reexam. No. 90/000,904, Requested: Nov. 14, 1985, Cl. 244/1R, CAMOUFLAGED AIRCRAFT SURFACE VESSEL OR VEHICLE OR THE LIKE, Carlisle K. Ferris, Owner of Record: *Inventor, Morris Plains, N.J.,* Attorney or Agent: Shlesinger, Arkwright, et al., Ex. Gp.: 310, Requester: Dept. of the Navy, Washington, D.C.

4,203,351, Reexam. No. 90/000,907, Requested: Nov. 14, 1985, Cl. 92/69R, FLUID MOTOR ACTUATOR FOR ROTATING A SHAFT BACK AND FORTH, Heinz G. Schwind, Owner of Record: *Griesel B.V., Hengelo, The Netherlands,* Attorney or Agent: Vincent L. Ramik, Ex. Gp.: 340, Requester: Pierik Metaal Ind. B.V., 7471 Er Goor, The Netherlands

4,454,692, Reexam. No. 90/000,911, Requested: Nov. 22, 1985, Cl. 52/221, METAL DECK RACEWAY CONSTRUCTION, Robert L. Ault, Owner of Record: *Epic Metals Corp., Rankin, Pa.,* Attorney or Agent: Arnold B. Silverman, Ex. Gp.: 350, Requester: Butler Mftg. Co., Kansas City, Mo.

4,501,659, Reexam. No. 90/000,910, Requested: Nov. 21, 1985, Cl. 210/169, SKIMMER APPARATUS FOR SWIMMING POOLS, Charles R. Henk, Owner of Record: *Inventor, Brick Town, N.J.,* Attorney or Agent: Dann, Dorfman, et al, Ex. Gp.: 130, Requester: Birch, Stewart, et al., Falls Church, Va.

Change to the Processing Period for Trademark Registrations Issued

The processing period between publication for opposition and registration will be changed from 10 weeks to 12 weeks beginning with applications published for opposition on Oct. 15, 1985. Therefore, from Oct. 15, 1985 onward, trademark applicants can expect to receive a registration 12 weeks after the mark is published for opposition so long as an opposition or request for extension of time to oppose is not filed against their application.

As a result of the change from a 10-week to a 12-week processing period, few if any registrations will

issue in the Dec. 24, 1985 and Dec. 31, 1985 Trademark Official Gazettes.

MARGARET M. LAURENCE,
Oct. 29, 1985. *Assistant Commissioner, for Trademarks.*

National Inventors Day

The Patent and Trademark Office, the National Council of Patent Law Associations and the National Inventors Hall of Fame Foundation, Inc. will sponsor National Inventors Day in the Public Search Room on Saturday, Feb. 8, from 1:00 p.m. to 5:00 p.m., and Sunday, Feb. 9, 1986 from 10:00 a.m. to 5:00 p.m. The public is invited to view the exhibits on these days. Inventors will be inducted into the National Inventors Hall of Fame on Sunday, Feb. 9, at 2:00 p.m.

In order to assemble exhibits, it will be necessary to close the Search Room on Friday, Feb. 7, at 5:00 p.m. The removal of all personal property from the Search Room would be appreciated.

DONALD J. QUIGG,
Dec. 23, 1985. *Assistant Secretary and Commissioner of Patents and Trademarks.*

O.G. Notice

Patent Cooperation Treaty (PCT) Update

Change in International Fees Effective January 1, 1986

The International Bureau of the World Intellectual Property Organization has informed the United States Patent and Trademark Office that, due to changes in the exchange rate of the U.S. dollar with regard to the Swiss franc, the dollar amount of the International Fees for PCT applications filed in the United States Receiving Office will increase. Effective January 1, 1986 the amount of the International Fees for PCT applications filed in the United States Receiving Office will be:

Basic fee (first 30 pages)	325.00
Basic Supplemental Fee (each page over 30)	6.00
Designation Fee (per country or region up to ten)	80.00
Designation Fee (for 11th and subsequent countries or regions)	No Charge

The International Bureau has also informed the United States Patent and Trademark Office that, due to changes in the exchange rate of the U.S. dollar to the Federal Republic of Germany deutsche mark, the dollar amount of the search fee for an international search under the PCT by the European Patent Office will increase from $750.00 to $830.00 effective February 9, 1986.

12-17-85
Date

Donald J. Quigg
Assistant Secretary and
Commissioner of Patents
and Trademarks

Status of PTO Services

The following is an update of the status of PTO services for November 1985:

Service Item	FY 1985 Goal (Calendar Days)	FY 1986 Goal (Calendar Days)	Monthly Average (Calendar Days)
Filing Receipts:			
Patents	22	22	20
Trademarks	30	30	32
Patent/Trademark Copies:			
Special Window Coupons	1	1	98% within 1 day
Window Coupons	5	5	97% within 5 days
Mail Coupons	29	26	99% within 26 days*
Letter Orders	34	26	99% within 26 days*
Date of oldest unfilled order			Nov. 22, 1985
Current Mail Date being processed			Nov. 29, 1985
Certified Copies:			
Trademark Registrations	30	30	19
Applications-As-Filed	20	10	92% within 7 days
File-Wrapper/Contents	N/A	N/A	80% within 7 days
Walk-up Certification	1	1	85% within 24 hours
Trademark Search Library:			
Filing Pending Marks	21	21	29
Filing Reg. Certificates	3	Issue Date	On schedule
Assignments:			
Patents	25	20	19
Trademarks	25	20	20
Avg. Days from Issue Fee Payment to Issue Date	90–100	90–100	90
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	4 weeks prior to Issue Date	On schedule
Patent Copies Available	Issue Date	Issue Date	99% on Issue Date
Trademark Copies Available	Issue Date	Issue Date	99% on Issue Date

*Figures include postal processing and delivery time.

IMPROVEMENTS IN SERVICES

- *Patent Files Access* — As reported last month, we have greatly improved access for retrieval of patented files by transferring files numbering 4,000,000 through 4,097,902 from the Suitland Federal Records Center to our Eads Street File Repository. In addition, the 1970 series abandoned patent applications, serial numbers 000001 through 199999, were also obtained and are now readily available. During this effort, 13,600 abandoned patent applications and 4,600 patented files were discovered. These files were heretofore unavailable due to a mix-up in records when they were retired to the Records Center in 1971. As a result, more than 70 official searches, both current and terminated, have been resolved. Also, in excess of 110 files which were thought to be lost have been found. For information regarding the number ranges of the "newly discovered" files, please call Luther Campbell on (703) 557–3560.

- *Electronic Copy Ordering Update* — After the Nov. 26, 1985, O.G. Notice announcing this service, we decided to explore another potential method for ordering patent and trademark copies using a telephone. We are currently exploring both electronic and telephone ordering methods and have asked our deposit account customers for their comments by Dec. 16. For this reason, we will not be prepared to implement either of the new services in Jan. 1986, as planned. We hope to have either the electronic ordering service or the telephone ordering service available by Apr. 1986.

- *Submission of Drawings* — As further clarification of the O.G. Notice of Oct. 29, 1985, drawings for patent applications do *not* need to be submitted on bristol board.

  Since corrections are now the responsibility of applicants, it is more convenient for the original drawings to be kept in their possession. Only copies need to be supplied to the Patent and Trademark Office. Whether or not bristol board is used for the copies is the applicant's choice. However, the copies that are submitted to the Office must be on strong, white, smooth, and non-shiny paper. High-quality copies are necessary not only for the patent examination process, but for printing purposes.

  If corrections are necessary, they should be made to the original drawings. Either a good copy of the corrected drawings or the corrected original can then be submitted after the Notice of Allowability is mailed.

  We will be revising 37 CFR to clarify the requirements for drawing submissions.

  In addition, we are planning to change 37 CFR 1.84 to allow submission of drawings in a third size, namely 8½ by 13 inches with a one inch (2.5 cm.) top margin and bottom and side margins of ¼ inch (6.4 mm.) from the edges. Pending the rule change, we will accept drawings in this size.

This change is being made for the convenience of applicants and attorneys.

HELPFUL HINTS FROM THE PTO

- *Extensions of Time in Patent Cases (Supplement Amendments) — If a timely and complete response has been filed after a Non-Final* Office Action, an extension of time is *not required* to permit filing and/or entry of an additional amendment after expiration of the shortened statutory period.

If a timely response has been filed after a *Final* Office Action, an extension of time *is required* to permit filing and/or entry of a Notice of Appeal or filing and/or entry of an additional amendment after expiration of the shortened statutory period unless the timely-filed response placed the application in condition for allowance. Of course, if a Notice of Appeal has been filed within the shortened statutory period, the period has ceased to run.

Direct questions to Al Lawrence Smith, Director, Group 350, on (703) 557-3414.

Dec. 10, 1985.

THERESA A. BRELSFORD,
Assistant Commissioner
for Administration.

PATENT NOTICES

Certificates of Correction for the Week of Dec. 31, 1985

Re. 32,008	4,492,105	4,525,390	4,537,591
D. 280,454	4,492,918	4,525,841	4,537,880
3,794,134	4,494,121	4,525,887	4,537,896
4,039,365	4,495,577	4,526,027	4,538,796
4,169,873	4,496,604	4,526,434	4,538,899
4,304,101	4,497,450	4,528,265	4,539,014
4,337,347	4,504,066	4,528,365	4,539,518
4,362,944	4,504,137	4,528,486	4,539,836
4,363,877	4,508,573	4,528,822	4,540,013
4,376,879	4,509,085	4,528,885	4,540,484
4,381,477	4,509,187	4,529,785	4,540,537
4,384,995	4,509,209	4,530,312	4,540,808
4,397,864	4,510,507	4,530,566	4,541,180
4,401,923	4,511,365	4,530,749	4,542,412
4,401,955	4,512,076	4,530,838	4,542,760
4,401,982	4,512,112	4,530,995	4,542,944
4,408,020	4,512,129	4,531,001	4,543,154
4,420,483	4,515,118	4,531,139	4,543,734
4,422,968	4,518,477	4,531,239	4,543,755
4,434,258	4,518,810	4,531,367	4,544,473
4,436,030	4,519,026	4,531,385	4,545,151
4,463,359	4,519,152	4,531,529	4,545,262
4,464,424	4,519,784	4,532,152	4,545,266
4,469,082	4,520,800	4,532,303	4,546,064
4,473,422	4,521,326	4,533,221	4,546,188
4,475,236	4,521,504	4,533,983	4,546,411
4,475,800	4,521,565	4,534,544	4,546,430
4,479,061	4,522,434	4,534,713	4,546,642
4,479,388	4,522,828	4,535,912	4,546,918
4,483,112	4,523,285	4,536,493	4,547,221
4,484,070	4,523,945	4,536,642	4,547,766
4,486,035	4,524,059	4,536,681	4,547,821
4,486,036	4,525,257	4,536,860	4,548,243
4,486,088	4,525,305	4,536,940	
4,486,745	4,525,356	4,537,231	
4,490,505	4,525,377	4,537,334	

Disclaimers

4,091,049.—*Santokh S. Labana,* Dearborn Heights; and *Yun-Feng Chang,* Plymouth, Mich. POWDER COATING COMPOSITIONS CONTAINING GLYCIDYL ESTER COPOLYMERS AND CARBOXYL TERMINATED CROSSLINKING AGENT. Patent dated May 23, 1978. Disclaimer filed Oct. 15, 1985, by the assignee, *Ford Motor Co.*

Hereby enters this disclaimer to claims 1, 2, 3, 4, 5, 8, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21 and 22 of said patent.

4,469,725.—*Paul Fischer,* Uitikon/Waldegg; and *Etienne Ponato,* Wallisellen, Switzerland. IDENTIFICATION CARD. Patent dated Sept. 4, 1984. Disclaimer filed Oct. 7, 1985, by the assignee, FIS Organisation AG.

The term of this patent subsequent to Sept. 30, 1985, has been disclaimed.

4,513,078.—*John M. Sandrik,* and *Norbert J. Pelc,* Wauwatosa, Wis. FILM-BASED DUAL ENERGY RADIOGRAPHY. Patent dated Apr. 23, 1985. Disclaimer filed Nov. 6, 1985, by the assignee, *General Electric Co.*

Hereby enters this disclaimer to claims 1 to 12 of said patent.

4,526,862.—*Norbert J. Pelc,* Wauwatosa, Wis. FILM-BASED DUAL ENERGY RADIOGRAPHY. Patent dated July 2, 1985. Disclaimer filed Nov. 6, 1985, by the assignee, *General Electric Co.*

Hereby enters this disclaimer to claims 1 to 8 of said patent.

4,544,213.—*Jerry M. Long,* Scotts Valley; and *James A. Womack,* Los Gatos, Calif. DISKETTE FILING AND STORAGE CONTAINER. Patent dated Oct. 1, 1985. Disclaimer filed Oct. 30, 1985, by the assignee, *Innovative Concepts, Inc.*

The term of this patent subsequent to Feb. 15, 1997, has been disclaimed.

Disclaimer and Dedication

4,139,669—*Chow M. Chang,* Taipei, Taiwan, Taiwan. NON-KNIFING PLASTIC ADHESIVE TAPE FOR PACKAGING AND SEALING PURPOSES. Patent dated Feb. 13, 1979. Disclaimer and Dedication filed Oct. 25, 1985, by the *inventor.*

Hereby disclaims and dedicates to the Public the entire remaining term of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware Library	(302) 451-2238
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
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Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
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New Jersey	Newark Public Library	(201) 733-7815
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New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
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Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
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Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF November 23, 1985

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	3-14-84
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-84
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-12-84
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	3-01-85
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	3-02-84
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	3-21-83
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	11-21-83
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—E. E. KUBASIEWICZ, Director	6-15-84
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	3-28-83
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	8-30-83
DESIGN, GROUP 290—K. L. CAGE, Director	3-14-83
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	7-12-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	8-29-83
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	3-30-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	10-19-83
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	10-02-84

Expiration of patents: The patents within the range of numbers indicated below expire during October 1985, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,408,657 to 3,413,655, inclusive

Plant Patents ..... Numbers 2,844 to 2,846 inclusive

REISSUES

DECEMBER 31, 1985

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,057

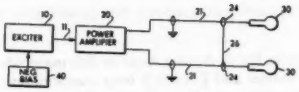
RADIO FREQUENCY TREATMENT OF TUMORS WHILE INDUCING HYPOTENSION

Harry H. LeVeen, 321 Confederate Cir., Charleston, S.C. 29407

Original No. 4,119,102, dated Oct. 10, 1978, Ser. No. 741,043, Nov. 11, 1976. Division of Ser. No. 643,661, Dec. 23, 1975, Pat. No. 3,991,770, which is a continuation-in-part of Ser. No. 595,094, Jul. 11, 1975, abandoned, which is a continuation-in-part of Ser. No. 436,102, Jan. 24, 1974, abandoned. Application for reissue Jun. 30, 1982, Ser. No. 393,628

Int. Cl.[4] A61N *1/40*

U.S. Cl. 128—804 **8 Claims**



5. A method of treating a naturally occurring tumor in a human comprising: placing a portion of the body of the human in which the tumor is located in a radio frequency electromagnetic field ranging in frequency from 100 kilohertz to less than 1000 megahertz, heating the tumor tissue in said portion of said body by absorption of energy from said radio frequency electromagnetic field for a period of time and with intensity sufficient to cause necrosis of said tumor, but insufficient to cause significant damage to the adjacent normal tissue in said field, while inducing hypotension in said body portion.

Re. 32,058

WEIGHING CONTROLLING FLOW RATE WITH TARING BETWEEN WEIGHINGS

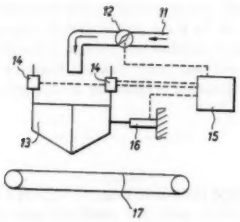
David Brunnschweiler, Balderstone Lodge, Commons La., Balderstone, Blackburn, Lancashire, and Barrie Sedgely, 5, Grange Way, Sandbach, Cheshire, both of England

Original No. 4,366,872, dated Jan. 4, 1983, Ser. No. 190,965, Sep. 26, 1980. Application for reissue Jan. 6, 1984, Ser. No. 568,916

Claims priority, application United Kingdom, Oct. 18, 1979, 7936211

Int. Cl.[4] G01G *19/22, 13/24, 13/14*; B67D *5/08*

U.S. Cl. 177—1 **2 Claims**



1. A method for regulating the continuous supply of material, comprising the steps of:

(a) taring a weighpan;

(b) loading a first quantity of material in said weighpan;

(c) comparing the weight of said first quantity with a desired weight and determining the difference;

(d) discharging said first quantity to a subsequent process requiring a consistent quantity of said material per unit time;

[taring said weighpan,]

(e) determining a second quantity based upon comparing said difference and said desired quantity;

(f) loading said second quantity of material in said weighpan;

(g) discharging said second quantity to said process; and

(h) repeating [the above] steps *b through g* whereby a consistent quantity of material is delivered to said subsequent process.

Re. 32,059

REAR DERAILLEUR AND CONTROL WIRE GUIDE

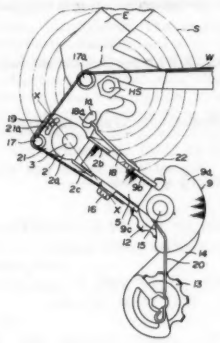
Masashi Nagano, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Original No. 4,306,871, dated Dec. 22, 1981, Ser. No. 101,443, Dec. 10, 1979. Application for reissue Jul. 13, 1983, Ser. No. 513,326

Claims priority, application Japan, Dec. 30, 1978, 53-166091; Dec. 30, 1978, 53-183721[U]; Feb. 5, 1979, 54-14342[U]; Feb. 5, 1979, 54-14343[U]

Int. Cl.[4] F16H *11/08*

U.S. Cl. 474—82 **12 Claims**



1. A speed-changing device for a bicycle for switching a driving chain to one of a plurality of axially aligned sprockets comprising:

a control wire;

a rear derailleur controlled by said control wire, said derailleur comprising a bracket fixed to a fork end of the bicycle and a pantograph mechanism pivoted swingably to said bracket through a horizontal first spindle, said pantograph mechanism comprising a supporting member pivoted to said bracket through said horizontal first spindle, two linkage members pivoted to said supporting member through second and third spindles perpendicular with respect to said horizontal first spindle, and a movable member pivoted to said two linkage members through fourth and fifth spindles perpendicular with respect to said horizontal first spindle, said movable member pivotally carrying through a horizontal sixth spindle parallel to said horizontal first spindle a chain change-over cage having two pulleys;

a wire holder for fixing therewith one end of said wire, said wire holder being provided at one of said two linkage members and said movable member at said pantograph mechanism; and

at least one *fixed* wire *guide for* guiding said wire, said wire

guide, *which said pantograph mechanism is movable with respect to, upon its rotation about said horizontal first spindle,* being disposed at a position outward with respect to the axis of said sprockets and beyond a phantom straight line connecting the axes of said wire holder and horizontal first spindle such that [when] *whenever* said wire, which is guided by said wire guide and fixed to said wire holder, is operated to transform said pantograph mechanism to thereby shift said pulleys axially of said [sprocket,] *sprockets, it simultaneously swings* said pantograph mechanism [swings] with respect to said bracket around said horizontal first spindle to also shift said pulleys radially of said [sprocket] *sprockets.*

Re. 32,060

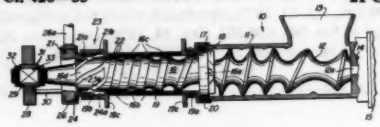
PROCESS FOR PRODUCING DEBONED MEAT PRODUCTS

Archie R. McFarland, Salt Lake County, Utah, assignor to Beehive Machinery, Inc., Salt Lake City, Utah

Original No. 3,741,772, dated Jun. 26, 1973, Ser. No. 881,686, Dec. 3, 1969. Continuation of Ser. No. 129,340, Mar. 11, 1980, abandoned, which is a division of Ser. No. 881,686, Dec. 3, 1969, Pat. No. 3,739,994, which is a continuation-in-part of Ser. No. 593,532, Nov. 10, 1966, abandoned. Application for reissue Jun. 25, 1981, Ser. No. 277,083

Int. Cl.[4] A23L *1/31, 1/325*

U.S. Cl. 426—55 **21 Claims**



1. A process for de-boning meat or fish materials containing soft fleshy matter and [boney] *bony* components, comprising the steps of introducing such a material into a perforated conduit that has a feed end and a discharge end and contains a rotary compression screw progressively decreasing in conveying capacity from feed end to discharge end; forming *and maintaining* a filter mat of [boney] *bony* components on the inside surface of the perforated conduit by operating said screw to force soft fleshy matter through the perforations of said conduit while retaining [boney] *bony* components against the inner surface of the conduit, *and by maintaining sufficient clearnce between said screw and said perforated conduit to maintain a thin coating of said bony components between said screw and said conduit*; compacting [boney] *bony* components into a tapered nonperforate section at the discharge end of the conduit; varying the cross-sectional area of said tapered section to govern the pressure exerted on the material within said conduit; and discharging the compacted [boney] *bony* components at said discharge end of the conduit.

PLANT PATENTS

GRANTED DECEMBER 31, 1985

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,614

AFRICAN VIOLET PLANT NAMED JO

Reinhold Holtkamp, Isselburg, Fed. Rep. of Germany, assignor to Gessellschaftsvertrag uber die Ergindergemeinschaft "Optimara", Fed. Rep. of Germany

Filed Jan. 5, 1984, Ser. No. 568,446
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet named Jo, as described and illustrated, and particularly characterized by its compact growth habit, relatively small, wavy and serrated girl-type leaves; intense red-purple flower color, profuse flowering, with 7–9 flowers being carried on upright flower stems, and by its long lasting and non-dropping flowers.

5,615

AFRICAN VIOLET PLANT NAMED MIAMI

Reinhold Holtkamp, Isselburg, Fed. Rep. of Germany, assignor to Gessellschaftsvertrag uber die Ergindergemeinschaft "Optimara", Fed. Rep. of Germany

Filed Jan. 5, 1984, Ser. No. 568,447
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet plant named Miami, as described and illustrated, and particularly characterized by its vigorous growth habit, girl-type leaves which are heavily indented and serrated, 7–9 upright flower stems each of which carries 5–9 flowers which are intensive pink and two-tone in color, with the center of the flower being darker, and by its profuse flowering habit.

5,616

AFRICAN VIOLET PLANT NAMED IMPROVED WASHINGTON

Reinhold Holtkamp, Isselburg, Fed. Rep. of Germany, assignor to Gessellschaftsvertrag uber die Ergindergemeinschaft "Optimara", Fed. Rep. of Germany

Filed Jan. 5, 1984, Ser. No. 568,448
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet plant named Improved Washington, as illustrated and described, and particularly characterized by its intense violet blue flower color and single to semi-double frilled flower shape; an abundance of strong and upright flower stems, each of which carry 9 or more flowers thereby making the cultivar highly floriferous; vigorous and compact growth habit, and by its yellow and prominent pollen, which provides a pleasing contrast to the flower color.

5,617

AFRICAN VIOLET PLANT NAMED NEW MEXICO

Reinhold Holtkamp, Isselburg, Fed. Rep. of Germany, assignor to Gessellschaftsvertrag uber die Ergindergemeinschaft "Optimara", Rees Haffen, Fed. Rep. of Germany

Filed Mar. 22, 1983, Ser. No. 477,690
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. An African violet plant named New Mexico, as described and illustrated, and particularly characterized by its vigorous growth habit and upright flower stems, lilac colored, frilled and undulated flowers with dark lilac margin and 7–10 large flowers per stem, and by its long lasting, non-dropping habit.

5,618

CHRYSANTHEMUM PLANT NAMED SIREN

William E. Duffett, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Jan. 27, 1984, Ser. No. 574,689
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium,* Ramat., plant named Siren, as described and illustrated, particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; daisy capitulum type; deep orange ray floret color; diameter across face of capitulum ranging from 7 to 8 cm. at maturity; uniform seven to eight week flowering response; short plant height; semi-spreading branching pattern; tolerance of both low winter 13° C. and high summer 24° C. to 38° C. temperatures for bud initiation and flower development.

5,619

CHRYSANTHEMUM PLANT NAMED TAN

William E. Duffett, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Jan. 27, 1984, Ser. No. 574,721
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium,* Ramat., plant named Tan, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; daisy capitulum type; greyed orange ray floret color; diameter across face of capitulum ranging from 5 to 6.25 cm. at maturity; uniform eight week flowering response; medium plant height; semi-spreading branching pattern; and tolerance of both low winter 13° C. to 21° C. and high summer 18° C. to 32° C. temperatures for bud initiation and flower development.

5,620

CHRYSANTHEMUM PLANT NAMED SPEARS

William E. Duffett, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Jan. 27, 1984, Ser. No. 574,722
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium,* Ramat., plant named Spears, as described and illustrated, particularly characterized as to uniqueness by the combined characteristics of spoon capitulum form; daisy capitulum type; white ray floret color; diameter across face of capitulum ranging from 6 to 8 cm. at maturity; uniform eight week flowering response; medium plant height; spreading branching pattern; tolerance of both low 13° C. and high 24° C. night, 38° C. day temperatures for initiation of buds and development of flowers.

5,621

CHRYSANTHEMUM PLANT NAMED VIM

William E. Duffett, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Jan. 16, 1984, Ser. No. 571,184
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—78 **1 Claim**

1. A new and distinct plant of *Chrysanthemum morifolium,* Ramat., named Vim, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; decorative capitulum type; deep yellow ray floret color; diameter across face of capitulum ranging from 5 to 7 cm. at maturity; uniform nine-week flowering response; medium plant height when grown single stem; 12 to 15 cm. peduncles on open, normally terminal sprays; and 13° C. minimum temperature tolerance for initiation and development of flowering buds.

PATENTS

GRANTED DEC. 31, 1985

ERRATA

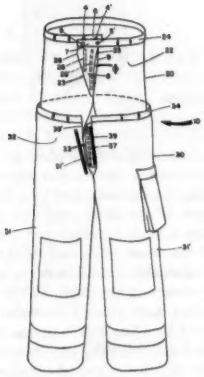
For CLASS	See PATENT NO.
623–002	4,561,129
209–305	4,561,540
522–091	4,561,950
522–033	4,561,951
514–788	4,562,075

PATENTS

GRANTED DECEMBER 31, 1985

GENERAL AND MECHANICAL

4,561,121
MULTILAYERED PROTECTIVE TROUSER
Carolyn C. Ehring, West Caldwell, and Edward W. Baumgartner, Edison, both of N.J., assignors to Cairns & Brother Inc., Clifton, N.J.
Filed Sep. 18, 1984, Ser. No. 651,803
Int. Cl.[4] A41D *1/06*
U.S. Cl. 2—2 **9 Claims**

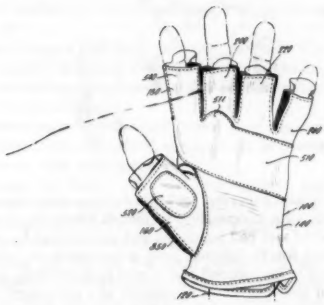


1. A multilayered protective trouser comprising:

a trouser inner liner comprising: an inner liner body section having a first fly opening; a storm flap having one side thereof fixedly attached to said inner liner body section, said storm flap being folded upon itself to form first and second layers; a first fastening means secured to a first surface of said first layer; and a second fastening means secured to a first surface of said second layer, said first surfaces of said first and second layers of said storm flap facing each other; and

a trouser outer shell positioned about said trouser inner liner, said trouser outer shell including: an outer shell body section having a second fly opening; an outer shell tab having one side thereof fixedly attached to said outer shell body section; said outer shell tab being removably positioned between said first and second layers of said storm flap; and third and fourth fastening means secured, respectively, to first and second surfaces of said outer shell tab; wherein said storm flap extends through said second fly opening to the exterior of said outer shell body section, and completely across and beyond said first fly opening, said first fastening means engages said third fastening means, and said second fastening means engages said fourth fastening means to form, respectively, first and second removable attachments between said outer shell tab of such trouser outer shell and said storm flap of said trouser inner liner.

4,561,122
PROTECTIVE GLOVE FOR MAXIMIZED TACTILEGNOSIS
Carol A. J. Stanley, Collingswood, N.J., and Kim C. Miller, Binghamton, N.Y., assignors to Stash, Inc., Collingswood, N.J.
Continuation-in-part of Ser. No. 387,661, Jun. 11, 1982, abandoned. This application Jan. 4, 1984, Ser. No. 568,133
Int. Cl.[4] A41D *13/10*
U.S. Cl. 2—20 **3 Claims**



1. A glove for protecting the hand, comprising a back portion and a palm portion, said palm portion including a metacarpal sheath covering at least the palm of the hand, a plurality of digital sheaths attached to the metacarpal sheath including a first digital sheath covering the thumb from the metacarpophalangeal joint to a predetermined point on the proximal phalanx of the first digit; and second digital sheaths covering the four fingers from the metacarpophalangeal joints to a predetermined point on each of the four respective middle phalanges, and means for absorbing impact shocks including a single unitary pad mounted on the exterior of said sheaths comprising a first palmar metacarpophalangeal pad portion extending from the digital palmar crease to the metacarpophalangeal joints and a second digital palmar pad portion covering the palmar surface of the proximal phalanx of the second digit of the hand and a third digital palmar pad portion covering a portion of the digital sheath of the third digit, and padding means interposed between said pad and said sheaths comprising a heat-sensitive, slow-recovery, shock-absorbing polyesper foam material which deforms on impact and slowly recovers its original shape and absorbs impact without transmission to an adjacent surface.

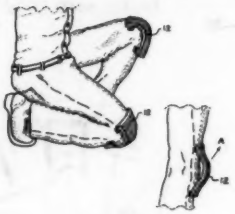
4,561,123
KNEE-PAD DEVICE
William L. Hull, P.O. Box DA, Los Gatos, Calif. 95031
Filed Feb. 17, 1984, Ser. No. 581,433
Int. Cl.[4] A41D *13/06*
U.S. Cl. 2—23 **2 Claims**

1. A pants and knee-pad combination comprising:

a pair of elongated, flexible pad assemblies, where each pad assembly has a first end, a second end, two side edges, a first fastener strip attached to an inner side surface of said pad assembly proximate said first end and extending between said two side edges, and a second fastener strip attached to said inner side surface proximate said second end and extending between said two side edges; and

pants having a pair of pants legs, where each of said pants legs has a knee portion and is provided with a third fastener strip firmly attached above said knee portion which is approxi-

mately the same length as said first fastener strip, and a fourth fastener strip firmly attached below said knee portion which is approximately the same length as said second fastener strip, said third fastener strip being removably engagable with said first fastener strip and said fourth fastener strip being removably engagable with said second fastener strip, where the distance between said third fastener strip and said fourth fastener strip is substantially less than the distance between said first fastener strip and said second fastener strip, and where said distance between said third fastener strip and said fourth fastener strip is fixed due to their firm attachment to said pants leg, said first fastener strip and said third fastener strip cooperating to inhibit lateral flexure of said first end of said pad assembly, and said second fastener strip and said fourth fastener strip cooperating to inhibit lateral flexure of said second end of said pad assembly, such that said pad assembly bows outwardly at a midlength section thereof located between said first end and said second end without substantial lateral flexure when said user is in a standing position to permit free air circulation between said user's knee area and said inner side surface of said pad assembly, and wherein said pad assembly conforms to said user's knee when said user is kneeling.



4,561,124

KNEE PADDING FOR WORK PANTS

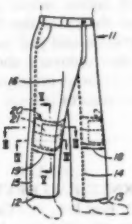
Albert N. Thompson, 592 Gunn Rd., Winnipeg, Manitoba, Canada (R2C 2Z9)

Filed Feb. 1, 1982, Ser. No. 344,676

Claims priority, application Canada, Feb. 20, 1981, 371334; Jun. 29, 1981, 380828; Jul. 6, 1981, 381220

Int. Cl.[4] A41D *13/00*

U.S. Cl. 2—23 **19 Claims**



1. A knee protector adapted to be secured to the knee portion of a trouser leg including an inseam and an outseam, said knee protector including a pocket to be stitched to said leg and a removable padding element complementary with the pocket for insertion into same, wherein said pocket comprises a pliable main panel having a normally top edge portion, a normally bottom edge portion and two side edge portions, the spacing of said side edge portions from each other generally corresponding to the front width of the respective leg at the knee region thereof as measured from the respective inseam, over the front of the knee portion, to the respective outseam, whereby the pockets can be stitched to the respective leg along two lines generally coincident with the inseam and the outseam of the leg, respectively.

4,561,125

DRESS

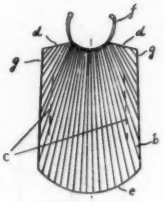
Antonio M. Llinas, La Orotava (Tenerife), Spain

Continuation of Ser. No. 352,843, Feb. 26, 1982, abandoned. This application Apr. 9, 1984, Ser. No. 598,415

Claims priority, application Spain, Feb. 26, 1981, 256.489

Int. Cl.[4] A41D *1/22*

U.S. Cl. 2—105 **2 Claims**



1. A dress, comprising a body portion formed of only two pieces of cloth joined to each other adjacent respective side edges of the dress by side seams and by a shoulder joining seam at shoulder edges of the dress, said two pieces when joined together forming a neck aperture and a front portion and a back portion of the dress; and a lace wrapping said neck aperture and being fastenable at said back portion and forming the single fastening means on the dress, said front portion and said back portion being each pleated over the entire area thereof from said lace to a hem line and from one side edge to another side edge of the dress, whereby the dress is fitable to a human being of any size, said side seams terminating at a distance from the shoulder joining seam to form two armholes at two sides of the dress and being each also spaced from the respective side edge of the dress by such a distance to form at said armholes sleeves during the use of the dress.

4,561,126

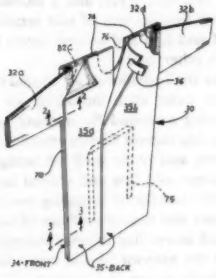
FOLDED SLEEVED GARMENT

Charles L. Truman, 127 Echo Dr., Hendersonville, N.C. 28739

Division of Ser. No. 415,659, Sep. 7, 1982, Pat. No. 4,523,336. This application Feb. 28, 1985, Ser. No. 706,552

Int. Cl.[4] A41B *1/00*

U.S. Cl. 2—115 **2 Claims**



1. A sleeved garment comprising:

substantially rectangular front and back fabric sections, one of said sections being longitudinally divided into panels to facilitate donning;

shoulder seams joining one end of said sections extending

transversely from a neck opening in at least one of said sections;

longitudinal side seams joining both side edges of said sections, a first one of said sections having an inwardly folded portion and a second one of said sections having a flat portion joined to said inwardly folded portion to provide a lapped seam; and

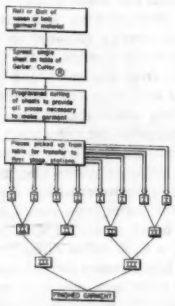
a pair of sleeves joined at the arm hole ends thereof between said inwardly folded portions and said flat portions of said sections to extend laterally outwardly from said sections with said arm holes accessible from inside the garment between said sections.

4,561,127

MAKING OF GARMENT BY SINGLE PLY CUTTING FOLLOWED BY SUCCESSIVE SEWING STAGES

Heinz J. Gerber, West Hartford, Conn., assignor to Gerber Scientific Inc., South Windsor, Conn.

Filed Oct. 25, 1982, Ser. No. 436,703
Int. Cl.⁴ A41D *27/00*
U.S. Cl. 2—243 R **2 Claims**


Roll or Bolt of woven or knit garment material
Spread, single sheet on table of Gerber Cutter
Programmed cutting of sheets to provide all pieces necessary to make garment
Pieces picked up from table for transfer to first stage stations
FINISHED GARMENT

1. A process for the manufacture of garments from pattern pieces comprising the steps of:

(a) spreading material on the work table of a cutting machine capable of programmed cutting under the control of a computer,

(b) cutting the material while it is on the table to provide pattern pieces of predetermined size and shape as dictated by the design characteristics of a particular garment,

(c) picking up the pattern pieces in preselected groups for transfer to first stage stations where these groups can be mated,

(d) joining the pieces in several such first stage stations to provide subassemblies comprising at least two joined pattern pieces,

(e) picking up the subassemblies and grouping certain of them for mating at second stage stations,

(f) joining said certain subassemblies at said second stage stations to provide assemblies comprising at least two joined subassemblies,

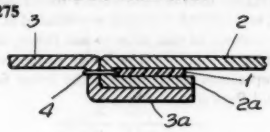
(g) continuing with the steps of joining, picking and grouping at successive stages, the step of grouping at the second and subsequent stages always being carried out to merge two processing lines from the preceding stage into one new processing line and to reduce the number of processing lines through the successive stages in a geometric progression until a complete garment is formed.

4,561,128

FUSING APPAREL SEAMS

Harry Zimmerman, 6830 Mewall Dr., San Diego, Calif. 92119

Filed Dec. 27, 1983, Ser. No. 565,745
Int. Cl.⁴ A41D *27/24*
U.S. Cl. 2—275 **2 Claims**



1. A method for making fused apparel seams, comprising the steps of:

positioning a first fabric segment adjacent a second fabric segment with a predetermined part of the first segment in overlapping alignment with a predetermined part of the second segment;

positioning a double-sided fusible strip adjacent a predetermined part of the first segment and in overlapping alignment with both segments;

sewing the fusible strip, the first segment, and the second segment together to form a seam, a first side of the seam comprising the fusible strip and a second side of the seam comprising the second segment;

folding the side of the seam comprising the fusible strip against the first segment with the fusible strip sandwiched between the seam and the first segment; and

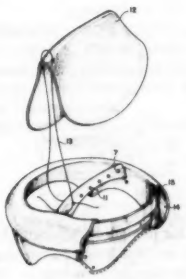
applying heat and pressure to the folded fabric to cause the fusible strip to fuse, thereby bonding the seam to the first segment.

4,561,129

LOW-PROFILE BIOLOGICAL BICUSPID VALVE

Marco Arpesella, Rimini, Italy, assignor to Pro. Bio. Spe. S.r.l., Rimini, Italy

Filed Oct. 11, 1983, Ser. No. 540,896
Claims priority, application Italy, Oct. 14, 1982, 3559 A/82
Int. Cl.⁴ A61F *1/22*
U.S. Cl. 623—2 **14 Claims**



1. A low-profile biological bicuspid valve prosthesis comprising:

an annular-like frame having a peripheral external groove disposed around its outside surface;

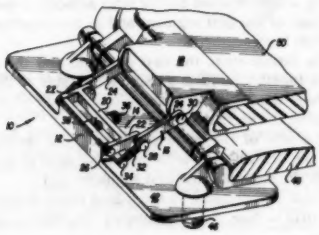
an annular-like thickening crown coupled to said frame and engaged with said groove;

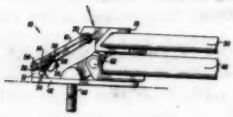
a covering on said crown; and

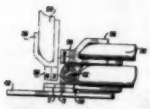
a rib centrally disposed within said frame with two flaps fixed to said rib so as to allow movement thereof between an open and closed position relative to said frame, said rib having a generally sawhorse-like configuration and com-

prising two arched members, each composed of a center base member and two legs depending from opposite ends thereof, which arched members are joined together along their respective center base members with their respective legs diverging laterally outwardly therefrom in a V-like manner, said arched members are secured at both ends to an inner surface of said annular-like frame, said legs each terminating at a point on an inner surface of said frame which represents approximately the lower final point for fixing said flaps to said rib.

4,561,130
TOILET SEAT COVER SAFETY LATCH
Dewey Bumgardner, 256 Country Club Dr., and Julian Marple, Jr., 19R Jackson Ave., both of Winchester, Va. 22601
Filed Jun. 5, 1984, Ser. No. 617,556
Int. Cl.[4] A47K *13/00*
U.S. Cl. 4—253 **9 Claims**



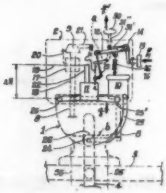




1. A safety latch for providing resistance to the opening of a toilet seat cover for a toilet bowl, comprising:
- a cover engaging element mounted to the back side of a toilet seat cover;
- a base fixed to the toilet bowl;
- linkage means interconnecting said cover engaging element and said base for providing resistance to the lifting of the toilet seat cover; and
- means for adjusting the magnitude of lifting resistance provided by said linkage means.

6. A safety latch for providing resistance to the opening of a toilet seat cover for a toilet bowl comprising magnet means for providing resistance to the opening of the cover; said magnet means including:
- a first magnet engaged with the toilet seat cover and a second magnet mounted adjacent the first magnet with like poles in confronting relationship when said seat is in the closed position;
- wherein the repulsive force between the magnets provides the resistances to the opening of the cover.

4,561,131
DUAL FLUSH TOILET FOR WATER SAVING
Constant V. David, 4952 Field St., San Diego, Calif. 92110
Filed Nov. 8, 1984, Ser. No. 669,338
Int. Cl.[4] E03D *1/14*
U.S. Cl. 4—326 **18 Claims**



1. A dual flush toilet including a toilet bowl having a small confined receptacle at its bottom and shaped for receiving waste matter therein, a toilet tank connected to the toilet bowl and to means for supplying water at high pressure, a water trap for preventing gases and waste matter from flowing back into the toilet bowl after flushing and shaped to minimize the amount of kinetic energy required to expel the mixture of waste matter and water present in the toilet bowl, means for introducing water from the toilet tank into the toilet bowl at low pressure and low velocity at the top of said toilet bowl, means for injecting water under high pressure and at high velocity at the bottom of the toilet bowl, means for selectively monitoring the introduction of low pressure water and the injection of high pressure water, said means being supported by and contained in the toilet tank, a waste matter evacuation duct connected the water trap, means for securing the toilet tank to the toilet bowl, means for securing the toilet bowl to a supporting floor, a flush valve directly connecting the toilet tank to the toilet bowl, means for automatically regulating the water level in the toilet tank, means for manually operating the flush valve, wherein the means for injecting the high pressure water is positioned opposite to the water trap entrance so as to create a jet pump effect and wherein the low pressure water is introduced at the top of the toilet bowl and distributed around the toilet bowl wall internal surface, and further including a high pressure automatic flush valve having an inlet pipe for receiving the supply of high pressure water, an outlet pipe for ducting the high pressure water from said valve to the high pressure water injecting means and means for initiating the operation of said valve, said high pressure automatic flush valve further comprising:
- a spring-loaded pilot valve activated by the means for selectively monitoring the injection of high pressure water;
- a diaphragm-actuated shuttle valve acting as a shutoff valve for controlling the passage of water through the high pressure automatic flush valve to the high pressure water injecting means and to servoflows of water as needed for rendering the operation of the high pressure automatic flush valve automatic;
- a spring-loaded piston for controlling the timely closings of the pilot valve and of the shuttle valve, said piston being equipped with a sliding seal located on its sliding land;
- a cylinder in which said piston travels in both directions, upward and downward, the end walls of said cylinder and of said piston thus forming two sealed closed chambers through which two servoflows are ducted, one servoflow through each of said chamber;
- a set of channels, equipped with a plurality of restricting orifices being located in a manner such that the amount of water flowing through said restricting orifices establishes

the pressure levels in said chambers, and having sizes relatively to each other's such that said water pressure levels thus determine the net force exerted on the piston, for ducting the servoflows;

a spring-loaded diaphragm connected to the pilot valve, located between two enclosed spaces, the upper space being vented to the toilet tank, and the lower space being connected to the servoflow channel leading to the pilot valve;

a diaphragm connected to the shuttle valve positioned between two closed volumes, the upper volume being connected to the upper chamber formed by the piston and its associated cylinder by the servoflow channel leading to the pilot valve; and

a body for holding the positioning all of the high pressure automatic flush valve components above recited in a manner such that the spring-loaded piston automatically closes the servoflow channel leading to the pilot valve when said piston reaches the end of its upwardly directed stroke.

4,561,132

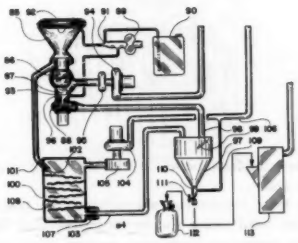
AIR-VAC TOILET

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005, and Michael Stranahan, P.O. Box 15, Woody Creek, Colo. 81656

Continuation-in-part of Ser. No. 474,967, Mar. 14, 1983, abandoned. This application Apr. 13, 1984, Ser. No. 600,151

Int. Cl.[4] E03D *11/00*

U.S. Cl. 4—420 **16 Claims**



1. An air-vac toilet system comprising in combination:

(a) a toilet bowl of a funnel-shaped tubular construction including a seat disposed at the diverging end and further including a converging bottom;

(b) an air-lock valve with the inlet connected to said converging bottom of said toilet bowl;

(c) a dehydration-evaporation chamber connected to the outlet of said air-lock valve;

(d) means for creating an evacuated state in said dehydration-evaporation chamber wherein waste transferred across said air-lock valve from said toilet bowl to said dehydration-evaporation chamber is vacuum dried and evaporated by said means for creating an evacuated state;

(e) means for conveying the dehydrated solid waste out of said dehydration-evaporation chamber; and

(f) means for storing and disposing of the dehydrated solid waste discharged from said dehydration-evaporation chamber by said means for conveying.

4,561,133

JET STREAM DEVICE

Karsten Laing, 632 Marsat Ct., Chula Vista, Calif. 92011

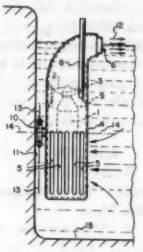
Filed Apr. 9, 1984, Ser. No. 598,067

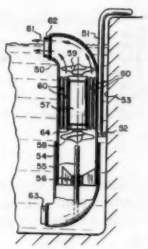
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1983, 3313549; Apr. 14, 1983, 3313548

Int. Cl.[4] A47K *3/10;* **E04H** *3/18*

U.S. Cl. 4—491 **15 Claims**

1. A submersible jet stream device for a swimming pool, the device comprising a longitudinally extending housing having inlet-apertures and an outlet-nozzle extending substantially at a right angle to the housing, a flow-constricting necking situated between the inlet-apertures and the nozzle, an axial impeller rotatable by an underwater motor with said impeller being situated in the necking with its axis of rotation extending paral-





lel to the longitudinal axis of the housing, the cross-sectional area of the necking having approximately the same surface as the outlet surface of the nozzle, characterized by having means for changing the position of the outlet nozzle between a first position near the water surface and a second position close to the bottom of the swimming pool.

4,561,134

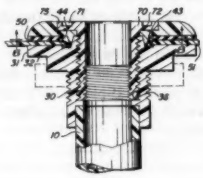
FITTING ASSEMBLY FOR VINYL LINED POOLS

Lester R. Mathews, 9810 N. 37th St., Phoenix, Ariz. 85028, and Jay Galvin, Tempe, Ariz., assignors to Lester Mathews, Phoenix, Ariz.; Water Circ.Patents, Inc., Syracuse, N.Y. and Lucien Warner, Carefree, Ariz.

Filed Oct. 9, 1984, Ser. No. 658,668

Int. Cl.[4] E04H *3/18*

U.S. Cl. 4—496 **24 Claims**



1. An improved fitting and cap assembly for use in conjunction with an opening through the wall of a pool with a vinyl liner, including in combination:

a fitting member extending through an opening in a wall of the pool and having a flange for engaging the interior wall surface around the opening through the wall of the pool,

the flange of said fitting member having a cap-alignment means on the outer surface thereof;

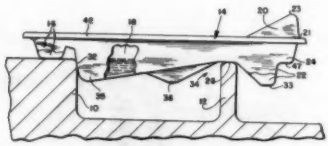
a cap having an opening therein and dimensioned to overlie at least a major portion of the surface of the flange on said fitting member, said cap further having engaging means thereon for matingly engaging the alignment means on the flange of said fitting member; and

a gasket on the surface of said cap which faces the flange, said gasket having a tacky adhesive on the surface thereof facing the flange when said cap is positioned over the flange with the engaging means of said cap engaging the alignment means on the flange.

4,561,135
BABY BATH

David Adriaansen, Arlington, Mass., assignor to Tucker Housewares, Inc., Leominster, Mass.

Filed Aug. 16, 1984, Ser. No. 641,252
Int. Cl.[4] A47K *3/024*
U.S. Cl. 4—572 **6 Claims**



1. A portable molded plastic one-piece bath configured for use on a single or double basin sink having a divider, said bath comprising a front wall, a bottom, a pair of opposite side walls and a rear wall area,

the bottom being inclined from a deepest area adjacent the front wall to a highest point adjacent the rear wall area, said bottom rising to a point well above and forward of the rear wall area,

said bottom including a back rest portion narrower than the bottom and spaced inwardly from the side walls, forming spaces between the side walls and the back rest, said bottom having a narrow strip on each side of said back rest portion between said back rest portion and said opposite side walls,

a downwardly extending depression formed in each narrow strip, said depressions forming a rear legs for the bath, said legs being located intermediate the extent of the back rest portion,

said legs, narrow strips and said back rest portion being configured and dimensioned to form a transverse recess across the width of said bath for receiving the divider of a double basin sink between them, thereby positioning the bath with the divider below the back rest and thereby below the bath occupant, each narrow strip having a flat surface portion for seating on the top of said divider,

hollow extensions on said legs, said extensions being shorter than the legs and extending rearwardly thereof,

spaced depressions in the bath forwardly of the front wall and integral therewith, said front depressions having bottom surfaces generally co-planar with said extensions, and forming therewith fore and aft supports for the bath in a single basin sink.

4,561,136
SHOWER TRACK

Martin D. Baer, 1816 Cedar Hill Rd., Norman, Okla. 73069

Filed Dec. 31, 1984, Ser. No. 687,774
Int. Cl.[4] B05B *3/18*
U.S. Cl. 4—615 **5 Claims**

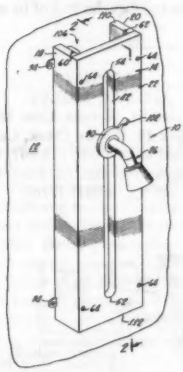
1. A shower track assembly comprising:

a housing having means defining a slot in a front panel thereof, said housing including a pair of sides attached to the front panel and means for attaching said pair of sides to a shower wall over a shower head outlet,

said sides including abutment and guide means for containing a flexible hose within the housing in a generally U-shaped configuration for enabling a shower head to be positioned along said slot from one end of the slot to another end of the slot, and for stabilizing the shower head along the slot when water is flowing therethrough:

a shower head;

means for slidably mounting said shower head along the slot for enabling adjustment of the height of the shower head from a shower floor when the housing is mounted to a shower wall with the slot in a generally vertical orientation, said means for slidably mounting said shower head along the slot including bracket means disposed behind



said housing front panel for slidably engaging said housing sides; and

flexible hose means for maintaining the position of the shower head along the housing slot, said flexible hose means interconnecting said shower head and disposed behind said housing front panel and between said housing sides, said flexible hose means having a preselected length and radius of curvature to enable the shower head to be positioned along said slot from one end of the slot while the flexible hose maintains contact with both said housing sides, said flexible hose means having sufficient resilience to enable movement of said shower head along the slot and to stabilize the shower head along the slot during water flow through the shower head by exerting force against the housing side walls.

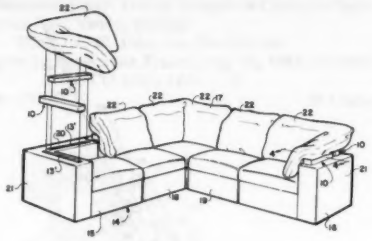
4,561,137
FURNITURE BOLSTER

Robert A. Smitherman; Thomas A. Staats, and William E. Hoover, all of 236 Richmond Rd., Salisbury, N.C. 28144

Filed Nov. 30, 1983, Ser. No. 556,317
Int. Cl.[4] A47C *17/00*
U.S. Cl. 5—12 R **3 Claims**

1. An article of furniture comprising a frame including a seat portion and an integral back extending upwardly from the seat portion and terminating in a fixed plane above the seat portion, a bolster formed in an elongated rectangular configuration separately from the frame, means for releasably attaching the bolster to the back of the furniture in said fixed plane above the seat portion with the bolster extending upwardly from said fixed plane, and a flexible cushion extending upwardly from the seat portion, upwardly along the back and over the bolster, whereby the apparent height of the furniture may be selec-

tively changed by removing the bolster and positioning the flexible cushion to extend upwardly from the seat portion,



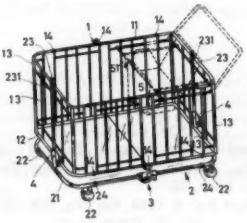
upwardly along the back and over the upper end of the back in said fixed plane.

4,561,138

FOLDABLE BABY BED

Tsong-Ching Hwang, No. 54-5, Hsin-Sheng S. Rd. Sec. 1, Taipei, Taiwan

Filed Dec. 28, 1983, Ser. No. 566,224
Int. Cl.⁴ A47D *9/00*
U.S. Cl. 5—102 **3 Claims**



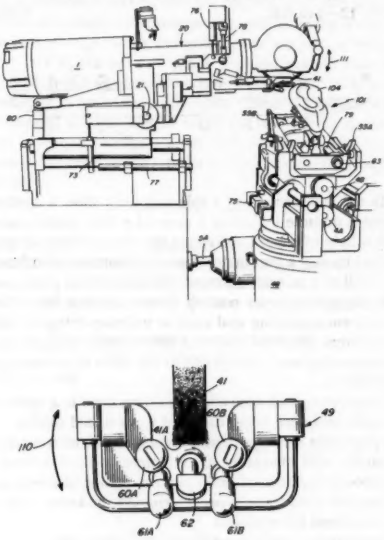
1. An improved foldable baby bed comprising:
a foldable bed frame and a foldable bed base wherein
the bed frame is composed of an upper boundary tube and a lower boundary tube, said upper boundary tube having a front side, a back side, a left side and a right side, said lower boundary tube having a front side, a back side, a left side and a right side and a plurality of support posts between the upper and lower boundary tubes,
said bed base is composed of a base boundary tube having a front side tube, a back side tube, a left side tube and a right side tube, said base boundary tube having four castors at its four lower corners, two support rods respectively extending upwardly from the middle of said left side of said base boundary tube and from said right side of said base boundary tube, said two support rods each having pivot means at the upper end of each said rod, said bed frame being coupled to each said support rod by said pivot means and being suspended whereby said bed frame is swingable with respect to said two support rods;
a hinged connection at the middle and at the end of each of said left and right side tubes of said upper boundary tube and of said lower boundary tube of said bed frame;
a folding mechanism at the end and at the middle of each of said left and right boundary tube of said base; and
a pair of male and female joint elements which are hinged together and releasably lockable to each other, wherein each said male joint element has a U-shaped cross-sectional end and each said female joint element has a U-shaped cross-sectional end configured to receive U-shaped cross-sectional end of a said respective male joint element, said male joint element having two compressible tabs extending outwardly and laterally from the edges of a said female joint element when said female joint element and said male joint element are in a locked position.

4,561,139

MACHINE FOR AUTOMATICALLY ROUGHING THE CEMENT MARGIN OF A FOOTWEAR UPPER ASSEMBLY

Michael M. Becka, Nashua, and William G. Goodenough, West Swanzey, both of N.H., assignors to International Shoe Machine Corporation, Nashua, N.H.

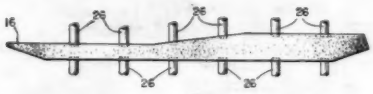
Filed Jan. 20, 1984, Ser. No. 572,349
Int. Cl.⁴ A43D *95/00*; **C14B** *01/44*
U.S. Cl. 12—1 R **31 Claims**



26. Apparatus for roughing the cement margin of a footwear upper assembly, that comprises:
means for supporting a footwear upper assembly by a mechanism capable of applying to the upper assembly rocking movement, translational movement and rotational movement;
means for roughing the cement margin; and
means for effecting a combination of said rocking movement, translational movement and rotational movement to the upper assembly while simultaneously effecting roughing of the cement margin by the means for roughing, which combination of movements serves continuously to present a new roughing surface to the means for roughing in the course of roughing to present an essentially constant contact area between the means for roughing and the cement margin in the course of roughing and, hence, results in uniformity of roughing, said rotational movement serving to cause the means for roughing to continuously track the cement margin with a determined orientation therebetween as the cement margin moves past the roughing portion of the means for roughing, wherein said rotational movement includes angular indexing movement of the upper assembly in the course of roughing in the region between the toe portion and the heel portion of the upper assembly to maintain the determined orientation substantially constant despite direction changes of the cement margin between said toe portion and said heel portion said rocking movement being about a transverse

axis of the footwear upper assembly between the toe portion and the heel portion of the footwear upper assembly.

4,561,140
SOLE CONSTRUCTION FOR FOOTWEAR
Kenneth W. Graham, Wakefield; Edward J. Norton, Boxford, both of Mass., and Shuhei Kurata, Fukuoka, Japan, assignors to New Balance Athletic Shoe, Inc., Lawrence, Mass.
Continuation-in-part of Ser. No. 535,288, Sep. 23, 1983. This application Jun. 5, 1984, Ser. No. 617,388
Int. Cl.[4] A43B *13/04, 13/14, 13/18, 21/32*
U.S. Cl. 12—146 BR **8 Claims**



1. In the manufacture of a sole unit for a shoe, a method of forming a midsole including a core of a first plastic material which is light of weight, providing the characteristic of springiness and having a durometer reading (Shore A) of at least 15, and a shell of a second, different and more dense plastic material having a durometer reading (Shore A) of at least 20 substantially encapsulating said core to maintain integrity and to prevent break down of said core under stress, comprising

(a) supporting said core on one or the other of an outsole and an insole,

(b) supporting said core and sole component in a cavity of a mold, said core being disposed toward said cavity,

(c) providing a charge of said second plastic material to said cavity, said charge being sufficient to flow around the exposed surfaces of said core for complete coverage of exposed surfaces to a predetermined thickness of no less than about 0.5 mm, and

(d) permitting said second material to set in situ.

4,561,141
SELF-WRINGING MOP
George S. Trisolini, Via Donatello 5, Palagiano (Taranto), Italy
Filed Dec. 19, 1983, Ser. No. 562,869
Claims priority, application Italy, Feb. 16, 1983, 66302 A/83
Int. Cl.[4] B08B *11/02*
U.S. Cl. 15—3 **9 Claims**

1. A mop comprising:

a mop handle;

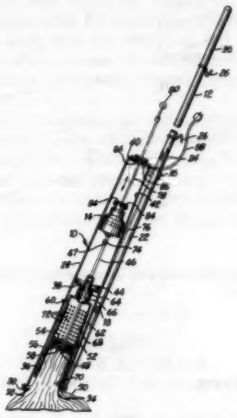
a housing mounted upon the mop handle and having an opening therein;

a basket journaled for rotation within the housing, the basket having an axially-extending perforated wall and a mouth adjacent the opening in the housing;

a wiper mounted for rotation upon the mop handle and for selective movement relative to the mop handle, the basket and the housing between an advanced position outside the housing, where at least a portion of the wiper is located in position for wiping, and a retracted position within the housing, wherein the wiper is located within the basket;

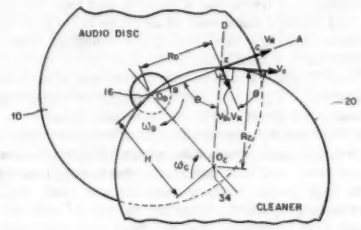
actuating means mounted upon the mop handle for selectively moving the wiper between the advanced position and the retracted position; and

a motor within the housing and coupled with the wiper for rotation of the wiper when the wiper is in the retracted position such that the wiper is forced against the perforated wall of the basket to couple the basket for rotation with the wiper in the same direction of rotation as the



rotation of the wiper and matter in the wiper is extracted therefrom through the perforated wall of the basket.

4,561,142
DISC CLEANER
Peter S. Mischenko, Mount Prospect, Ill., and George T. Buehl, Columbia, Mo., assignors to International Jensen Incorporated, Schiller Park, Ill.
Filed Jan. 6, 1984, Ser. No. 568,732
Int. Cl.[4] B08B *11/02*
U.S. Cl. 15—97 R **30 Claims**



1. A disc cleaning device comprising:

a disc support platform mounted to rotate about a first axis, said platform adapted to support a disc having a recorded area to be cleaned and to center the disc to be cleaned about the first axis;

a cleaning disc surface mounted to rotate about a second axis, spaced from the first axis, said cleaning surface positioned to contact a disc to be cleaned supported on the platform;

means for rotating the platform about the first axis; and

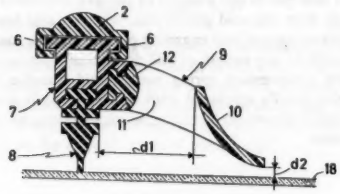
means for rotating the cleaning surface about the second axis at a rate selected to ensure that the relative movement between the cleaning surface and the disc to be cleaned is oriented substantially radially with respect to the first axis to provide a substantially radial cleaning of at least the recorded area of the disc to be cleaned.

4,561,143

WIPER BLADE WITH AIR DEFLECTING DEVICE

Christian Beneteau, Gorcy, France, assignor to Champion Spark Plug Europe S.A., Virton, Belgium

Filed Jul. 19, 1984, Ser. No. 632,489
Claims priority, application France, Aug. 18, 1983, 83 13443
Int. Cl.⁴ B60S *1/04, 1/38*
U.S. Cl. 15—250.42 **20 Claims**



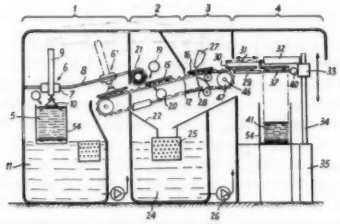
1. A wiper blade for motor vehicles or the like, comprising:
a superstructure connected to a wiping element which is reinforced by a longitudinal pressure distributing profile; and
an air deflecting device connected to the pressure distributing profile and including a deflector spaced from the wiping element to define at least one air opening between the deflector and the pressure distributing profile.

4,561,144

MACHINE FOR WASHING FLAT TABLEWARE

Jacques Marais, Villeneuve d'Ascq, France, assignor to Fast Lunch Societe Anonyme dite, Villeneuve d'Ascq, France

Filed Jul. 20, 1983, Ser. No. 516,049
Claims priority, application France, Jul. 29, 1982, 82 13272
Int. Cl.⁴ A47L *15/24, 15/48, 15/37;* B08B *1/02*
U.S. Cl. 15—302 **3 Claims**



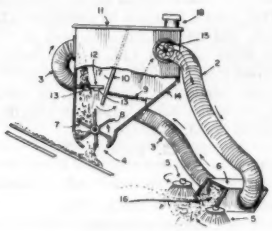
1. In a machine for mechanically washing and drying articles of flat tableware, including trays, plates, dishes or the like, of the type having:
an inlet for introduction of said articles and an outlet for evacuation thereof,
a brushing station having means for projecting detergent water,
a tank of detergent water supplied by the return of the water coming from said brushing station,
means for recycling the water from said tank towards the detergent water projecting means,
a drying station with means for projecting air,
means for conveying the articles from the inlet to the brushing station, and thereafter to the drying station and to the outlet, said means conveying the articles along an upward path forming an angle of between 10° and 30° with respect to the horizontal,
the improvement comprising:
the air projecting means being located immediately downstream of said brushing station, without the interposition of a rinsing station, and comprising a plurality of nozzles disposed transversely with respect to the advance of the articles above and below said articles, said nozzles projecting a flow of air in the form of a flat jet against the surface of the said articles at an angle of between 70° and 80° with respect to the inclined surface of said articles, the said flat jet of air being projected for scraping any detergent water remaining on the articles in the direction opposite the upward movement of said articles,
a first storage station located upstream of said inlet for storing articles of tableware stacked horizontally on one another, and
gripping means located at said first storage station for gripping and displacing each article of tableware individually for introduction thereof into the said machine inlet and for retrieval by said conveying means, said gripping means at the first storage station comprising suction pads, a vertical first jack at the base of which the said suction pads are located, a sliding element to bear the said first jack, a rail assembly to guide the said sliding element, a substantially horizontal second jack to move the said sliding element, and a second storage station downstream of said outlet adapted to receive the articles stacked horizontally on one another.

4,561,145

CONTINUOUS SWEEP FOR ROAD PLANING AND MILLING MACHINES

Winchester E. Latham, 10470 W. 21st St., Indianapolis, Ind. 46234

Filed Feb. 16, 1984, Ser. No. 580,958
Int. Cl.⁴ E01C *23/12*
U.S. Cl. 15—340 **14 Claims**

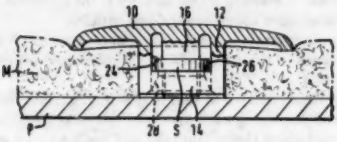


1. A sweeper apparatus for use with a mobile roadway cleaning vehicle or the like, the mobile roadway cleaning vehicle including pick-up means for gathering a portion of loose material spread on a roadway or other surface in the path of the vehicle, and conveyor means for transporting a stream of the loose material gathered by the pick-up means to a point of reclamation, the sweeper apparatus comprising
sweeper means for collecting an additional portion of the loose material spread on the roadway, the sweeper means being fixed to the mobile roadway cleaning vehicle to follow behind the pick-up means during operational movement of the vehicle so that substantially the remaining portion of loose material spread on the roadway in the path of the vehicle is removed from the roadway, and
hopper means for dispensing the additional portion of the loose material collected from the road surface by the sweeper means onto the stream of loose material transported on the conveyor means prior to arrival of the stream at its point of reclamation so that the portion of the loose material gathered by the pick-up means and the additional portion of the loose material collected by the following sweeper means are combined on the conveyor means prior to delivery to the point of reclamation.

4,561,146
PLASTIC FASTENER

Harald Schäty, Wetzlar, Fed. Rep. of Germany, assignor to USM Corporation, Farmington, Conn.

Filed Oct. 6, 1983, Ser. No. 539,646
Int. Cl.[4] A47G *27/02*
U.S. Cl. 16—7 4 Claims

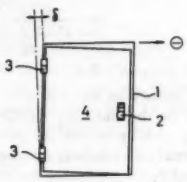


1. A plastic fastener having means for latching under a peripheral shoulder of a stud projecting from a surface and comprising a hollow shank within which the stud can be received and with an internal lip or lips to engage the shoulder of the stud characterized in that the shank of the fastener is provided in part by a rigid skirt extending around at least 180°, but not all, of the shank and in part by a resilient finger disposed in a gap formed between the ends of said skirt, said lips being provided, one on said finger and one coplanar therewith on said skirt, an opening formed through said skirt diametrically opposite said finger providing a bottom floor surface, said lip on said skirt being a continuation of said floor surface, said opening being at least as wide as said finger to provide a window so that the lip on said finger may be formed in an injection molding operation by a side core member which also forms said window.

4,561,147
HINGE WHICH FACILITATES OPENING DOOR AFTER THE GATE FRAME IS DISTORTED

Yoshiaki Katoh, and Hiroshi Inuzuka, both of Tokyo, Japan, assignors to Miwa Lock Co. Ltd., Tokyo, Japan

Filed Dec. 22, 1983, Ser. No. 564,739
Claims priority, application Japan, Dec. 27, 1982, 57-232539; Jun. 20, 1983, 58-109350; Jun. 27, 1983, 58-116578; Jul. 5, 1983, 58-121077; Jul. 25, 1983, 58-136364
Int. Cl.[4] E05D *5/12*
U.S. Cl. 16—380 16 Claims



1. A door hinge which facilitates the opening of a door after there has been relative distortion of said door and the gate frame to which said door hinge is attached, comprising

first and second vertically spaced metal plates each having a vertically oriented side edge, one of said first and second plates being attachable to said door and the other to said gate frame;

first and second vertically spaced knuckle cylinders formed integrally with said first and second metal plates, respectively, said second knuckle cylinder being positioned above said first knuckle cylinder with a clearance space therebetween, an engaging portion being provided within said second knuckle cylinder;

a pin slidably extending through said first and second knuckle cylinders, said first and second knuckle cylinders being axially displaceable with respect to each other along said pin;

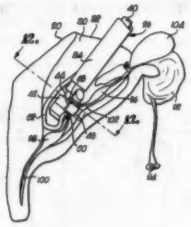
a load plug slidably inserted within said second knuckle cylinder and resting on the engaging portion thereof, said load plug contacting the upper end of said pin; and

compression spring means positioned within said second knuckle cylinder above said load plug, the force exerted by said compression spring means being greater than the load normally applied axially by the weight of said door on said pin in the absence of relative distortion between said door and said gate frame, whereby said load plug is pressed against said engaging portion and the load applied axially by the weight of said door to said pin is carried by said compression spring means, said knuckle cylinders being axially displaced with respect to each other when relative distortion occurs between said door and said gate frame.

4,561,148
MACHINE FOR PULLING VISCERA PACKAGE FROM FOWLS

James A. Bonuchi, Overland Park, Kans., and Frank J. Criscione, II, Kansas City, Mo., assignors to Simon-Johnson, Inc., Kansas City, Kans.

Filed Oct. 5, 1984, Ser. No. 658,407
Int. Cl.[4] A22C *21/06*
U.S. Cl. 17—11 15 Claims



1. In a machine for processing poultry, an eviscerating tool for insertion into the body cavity of the poultry through an opening at its vent and removal of the viscera of the poultry from the cavity through said opening upon withdrawal of the tool, said tool including:

a tube having a terminal end disposed adjacent said viscera when the tool is inserted into the cavity;

an elongated post rigidly secured to the tube adjacent said end thereof,

said post having a transversely round, exterior surface,

a shaft rotatable in said tube and extending therethrough beyond said end; and

a finger secured to the shaft for rotation therewith after the finger is disposed in said cavity,

said finger having a transversely flat, inner face,

said finger being disposed adjacent said post for gathering the viscera during rotation of the shaft, wrapping of the viscera around the finger with the viscera looped through the finger across said face and moving the viscera against said surface prior to and during withdrawal of the tool,

said surface and said face being smooth, even and free of edges, projections and other sharp formations.

4,561,149

METHOD OF INFLUENCING THE QUALITY, IN PARTICULAR THE TENDERNESS OF MEAT OF SLAUGHTERED ANIMALS BY MEANS OF AN ELECTRIC CURRENT

Johan W. Nijhuis, Winterswijk, Netherlands, assignor to Machinefabriek G. J. Nijhuis B.V., Netherlands

Filed Aug. 18, 1981, Ser. No. 293,883

Claims priority, application Netherlands, Aug. 19, 1980, 8004689

Int. Cl.[4] A22C *9/00*

U.S. Cl. 17—45 14 Claims

1. Method of influencing by means of an electric current the quality, in particular the tenderness, of the meat of a slaughter animal, comprising the step of passing the electric current through the animal during the time period following complete stunning so that the animal has completely lost consciousness, and prior to the clinical death of the animal.

4,561,150

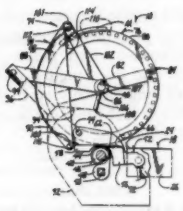
SKINNING MACHINE HAVING FEED DEVICE AND METHOD FOR USING SAME

Ray T. Townsend, 3131 Fleur Dr., Des Moines, Iowa 50321

Filed Dec. 5, 1983, Ser. No. 557,879

Int. Cl.[4] A22C *17/12*

U.S. Cl. 17—50 20 Claims



1. A feed device for feeding a piece of meat having a skin layer thereon into a meat skinning machine comprising a skinning blade means containing a knife edge presented in a first direction, a gripping roll having an outer toothed surface mounted for rotation about a horizontal axis adjacent said knife edge so that said outer toothed surface will move toward and closely adjacent said knife edge, said feed device comprising:

a cylindrical feed wheel positioned above said gripping roll and being rotatably mounted about a second horizontal axis spaced above said gripping roll, said feed wheel having an outer cylindrical portion formed of a material which permits viewing through said wheel;

an arcuate shield member having a concave surface positioned in outwardly spaced relation to said outer cylindrical portion of said feed wheel, said shield having an upper end spaced above said gripping roll and a lower end adjacent said gripping roll;

said spaced apart shield member and cylindrical portion of said feed wheel defining a feed chute positioned above said gripping roll for receiving said piece of meat and guiding said meat toward said gripping roll, said feed chute having an upper intake end formed by said upper end of said shield member and positioned in spaced relation above said gripping roll and a lower outlet end formed by said lower end of said shield member and positioned closely adjacent said gripping roll;

said outlet end of said chute facing toward said skinning blade whereby said gripping roll will grasp said meat as said meat exits from said outlet end and will pull said meat toward said knife edge for separating said skin layer from said meat.

4,561,151

METHOD AND APPARATUS FOR RUPTURING SLIVER DURING COILER CAN REPLACEMENT

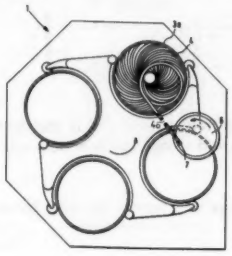
Theo Schöpwinkel, Monchen-Gladbach, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, Monchen-Gladbach, Fed. Rep. of Germany

Filed Jul. 9, 1984, Ser. No. 628,771

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1983, 3324461

Int. Cl.[4] B65H *67/04*

U.S. Cl. 19—159 R 11 Claims



1. A method of depositing sliver from a sliver producing apparatus into a coiler can, comprising the following steps:

(a) delivering the sliver from a sliver feeding device of a rotating coiler head into the coil can to build superposed sliver coils therein; said sliver feeding device orbiting in a circular path eccentrically with respect to the coiler can undergoing filling;

(b) replacing a full coiler can with an empty coiler can underneath the coiler head;

(c) rupturing the running sliver simultaneously with the replacing step; said rupturing step comprising the step of increasing the distance between said sliver feeding device of the coiler head and an uppermost sliver coil in the full coiler can for a short period at a time when said sliver feeding device is situated on an inner half circle of said circular path; said inner half circle being oriented towards a central axis of the coiler can undergoing filling; said step of increasing the distance being effected to an extent sufficient to cause rupture of said sliver; and

(d) continuing to deliver sliver from the sliver feeding device of said coiler head during said replacing and rupturing steps.

4,561,152

DRAFT ROLL SYSTEM FOR SPINNING MACHINES

Kiwamu Niimi, Toyoake, and Kenji Kinoshita, Tokai, both of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Karyia, Japan

Filed Jan. 20, 1984, Ser. No. 572,664

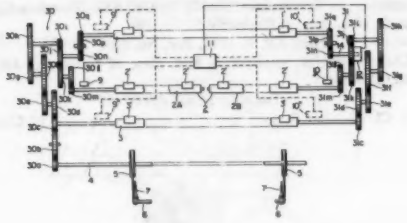
Claims priority, application Japan, Feb. 8, 1983, 58-19472; Feb. 8, 1983, 58-154606

Int. Cl.[4] D01H *5/86*

U.S. Cl. 19—244 7 Claims

1. A draft roll device for a spinning machine comprising a back bottom roll, means defining an apron bottom roll, and a front bottom roll, all connected at common side ends thereof to a driving source through a first drive transmission system and driven at a predetermined speed ratio between any two of said rolls, said means defining an apron bottom roll comprising a first apron bottom roll section at said common side end thereof and a separate and substantially independently mounted but axially aligned second apron bottom roll section at the other side end thereof; and said back bottom roll, said second apron bottom roll section, and said front bottom roll being opera-

tively connected at their respective other side ends to a second drive transmission system, whereby rotation of said back bot-



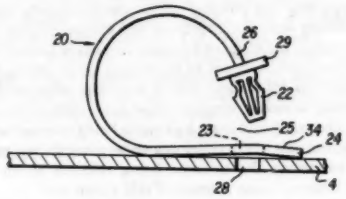
tom roll and said front bottom roll is transmitted from said other side end to said second apron bottom roll section.

4,561,153

CABLE CLAMP

Kazuhiro Matsui, Toyoake, Japan, assignor to Kitagawa Industries Co., Ltd., Nagoya, Japan

Continuation of Ser. No. 410,585, Aug. 23, 1982. This application Nov. 1, 1963, Ser. No. 547,677
Claims priority, application Japan, Aug. 27, 1981, 56-126760
Int. Cl.⁴ B65D *63/00*
U.S. Cl. 24—16 PB **1 Claim**



1. A cable clamp for securement of cables to a base comprising:

a resilient plastic band having a first end and a second end, said band being bendable in an arcuate shape about a center of curvature on one side of said band such that said first and second ends may approach one another, said second end being preformed with a longitudinal curve having a center of curvature on a side of said band opposite said one side;

a hole in said band along said longitudinal curve adjacent said second end;

a wedge shaped engaging projection having a larger end fixed to said band at said first end opposite said longitudinal curve and extending parallel to the length of said first end for insertion into a hole in said base; and

a pushing element formed between said first end and said engaging projection, said pushing element being engaged with said second end

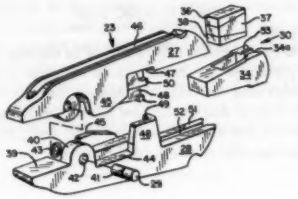
whereby when said engaging projection is inserted through a hole in a flat base located at said opposite side of said band, said longitudinal curve biases said pushing element away from said base so as to secure said clamp and to secure said cables in said clamp.

4,561,154

WEDGE-TYPE ROPE SOCKET CONNECTION AND METHOD

Terry L. Briscoe, and Robert L. Van Hoomissen, both of Portland, Oreg., assignors to ESCO Corporation, Portland, Oreg.

Filed Apr. 26, 1984, Ser. No. 604,063
Int. Cl.⁴ F16G *11/04*
U.S. Cl. 24—136 K **6 Claims**



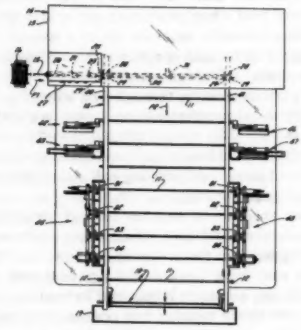
1. A socket-wedge connection for the wedge-type rope socket for an excavating bucket or the like comprising a relatively elongated socket having a larger end and a smaller end, a tapered passage extending from one end to the other, a rope in said passage looped upon itself to provide two lengths of rope in said passage with a loop adjacent said larger end, and a relatively elongated wedge between said two lengths, said wedge having a pair of longitudinally-extending wedge-forming means with collapsible insert means therebetween for relieving pressure on said two lengths, said insert means including a plurality of longitudinally tapered block means arranged to slide relative to each other unless constrained against relative longitudinal movement.

4,561,155

CORD MANUFACTURING APPARATUS AND CONNECTOR ATTACHMENT MACHINE THEREFOR

Magnus Randar, Menomonee Falls, Wis., and David G. Moore, Ecanaba, Mich., assignors to Artos Engineering Company, New Berlin, Wis.

Filed Jun. 22, 1983, Ser. No. 507,233
Int. Cl.⁴ H01R *43/00*; B23P *23/00*
U.S. Cl. 29—33 M **4 Claims**



1. Apparatus for manufacturing a cord from a connector and a cable segment,

said connector comprising a connector housing having a cable-receiving cavity therein, displaceable anchor means and a plurality of displaceable electrical contacts mounted on said connector housing,

said cable segment comprising a plurality of individually insu-

lated electrical conductors having an insulating sheath disposed therearound, said apparatus comprising:

(1) a conveyor for moving said cable segment in incremental steps along a path with the axis of said cable segment disposed transverse to said path;

(2) stripping means adjacent said path for removing a portion of said sheath from an end of said cable segment to expose the insulated conductors therewithin;

(3) trimming means adjacent said path for trimming the exposed ends of said insulated conductors to ensure that each electrical conductor extends substantially to the end of the insulation there-around;

(4) connector supply means; and

(5) connector attachment means adjacent said path for mechanically and electrically connecting a connector to the stripped and trimmed end of said cable segment so as to provide a cord, for testing said cord and for disposing of said cord if defective, said connector attachment means comprising:

(a) a supporting structure;

(b) first, second, third and fourth presses mounted on said supporting structure and disposed adjacent said path, each press comprising

(i) a stationary portion mounted on said supporting structure;

(ii) releasable holding means to temporarily hold in fixed position the end of a cable segment and an associated connector;

(iii) a first motor on said supporting structure for operating said releasable holding means;

(iv) a movable operating member for operating on a connector received in the press; and

(v) a rotatable pinion gear shaft for actuating said movable operating member;

(c) and drive means to effect synchronized movement of said movable operating members comprising

(i) a plurality of pinion gears, each pinion gear being connected to a rotatable pinion gear shaft of a respective movable operating member;

(ii) a toothed rack mounted for reciprocating movement on said supporting structure and engaged with said plurality of pinion gears; and

(iii) a second motor on said supporting structure for effecting reciprocating movement of said toothed rack;

said first press being operable to receive a connector from said connector supply means, to receive the stripped and trimmed end of said cable segment from said trimming means, to dispose said end in said cavity in said connector, and to displace said anchor means so as to mechanically engage said connector with said cable segment;

said second press being operable to receive said end of said cable segment with said connector mechanically attached thereto and to displace some of said electrical contacts so that each displaced contact pierces said insulation on an associated conductor and electrically engages said electrical conductor;

said third press being operable to receive said end of said cable segment with said connector mechanically attached thereto and with some of said contacts electrically engaged and to displace the remainder of said electrical contacts so that each displaced contact pierces said insulation on an associated conductor to provide a cord; and

said fourth press being operable to receive the connector end of said cord, to perform an electrical continuity test on said cord, and to dispose of said cord if defective.

4,561,156

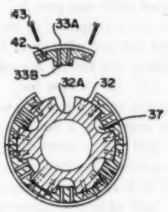
ROLLER FOR SUGAR CANE SQUEEZING MILLS

Ting-Zui Sun, No. 111, Fu-Nei La., Kao-Tan Village, Jen-Wu Country, Kao-Shiung Hsien, Taiwan

Continuation of Ser. No. 502,751, Jun. 9, 1983. This application Jun. 18, 1985, Ser. No. 745,826

Int. Cl.[4] B21B *27/02*

U.S. Cl. 29—121.6 **1 Claim**



1. An improved roller for a sugar cane squeezing mill, comprising:

a roller shaft;

a cylindrical mounting sleeve fixedly mounted over said roller shaft, said sleeve having a plurality of longitudinal slots equally spaced radially around a peripheral outer surface thereof; and

a plurality of roller shell segments each having a cross section of generally sector shape, an outer side provided with arcuate grooves and ridges and an inner side provided with a longitudinal key to fit one of said longitudinal slots of said mounting sleeve, said roller shell segments being radially detachably mounted onto said peripheral outer surface of said mounting sleeve;

a space being provided between each said longitudinal slot of said mounting sleeve and each said longitudinal key of said mounted roller shell segments to form a passage therebetween extending along the length of said mounting sleeve, each said groove of each said roller shell segment being provided with two juice collecting ports communicating with said passage.

4,561,157

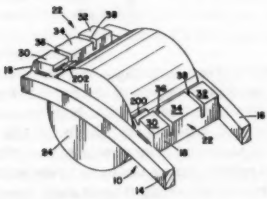
METHOD FOR FORMING ROLLER RETAINERS IN A BEARING CAGE

Paul H. Johnson, Jamestown, N.Y., assignor to TRW Inc., Cleveland, Ohio

Filed Apr. 22, 1982, Ser. No. 370,695

Int. Cl.[4] B21C *37/30*

U.S. Cl. 29—148.4 A **8 Claims**



1. A method for retaining roller members in a bearing cage wherein said cage includes a bearing cage plane and a plurality of roller receiving pockets disposed in a predetermined relationship relative to each other, and a roller disposed in each of said roller receiving pockets, said cage further including a plurality of web portions defining receiving pocket walls, said method comprising the steps of:

(a) providing at least one lug on each web portion, said lug protruding outwardly from said web portion in a direction generally normal to said cage plane;

(b) positioning said cage so that the lug on at least one web is disposed in operative relation to a staking punch having a predetermined conformation;
(c) moving the lug on said one web and said at least punch into cooperative communication with each other;
(d) precisely locating the lug on said one web relative to said punch by engaging a roller disposed in a roller receiving pocket positioned adjacent said one web with a locator bar associated with said punch
(e) urging the roller disposed in the roller receiving pocket into physical contact with an adjacent web portion of the roller receiving pocket by use of a tapered contact area associated with the locator bar;
(f) continuing said step of moving with said punch engaging said lug for imparting a staking action thereto so that a portion of said lug is worked to a preselected position overlaying at least a portion of said adjacent roller receiving pocket in a capturing relationship with said roller disposed in said adjacent receiving pocket;
(g) causing said locator bar to be retracted relative to said punch during said step of continuing; and,
(h) subsequently retracting said punch and said lug from cooperative communication with each other.

4,561,158
METHOD FOR MANUFACTURING A THROTTLE-CONTROLLED INDUCTION PASSAGE ASSEMBLY

Kalin S. Johnson, Northville, and Daniel E. Alsobrooks, Flat Rock, both of Mich., assignors to Colt Industries Operating Corp, New York, N.Y.

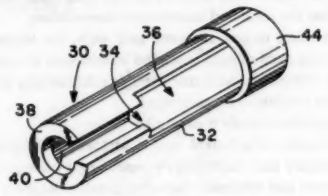
Division of Ser. No. 364,981, Apr. 2, 1982, Pat. No. 4,480,367. This application May 4, 1984, Ser. No. 607,184
Int. Cl.[4] B23P *15/00*
U.S. Cl. 29—156.4 R **6 Claims**

1. A method of manufacturing a throttle controlled induction passage assembly comprising the steps of forming induction passage means through suitable body means, forming a single throttle shaft, securing said single throttle shaft to said body means as to extend transversely of and totally through said induction passage means and to be freely rotatable about a longitudinal axis of said single throttle shaft, operatively locking said single throttle shaft to said body means as to at least limit the amount of axial movement of said single throttle shaft relative to said body means, forming a throttle valve, positioning said throttle valve for attachment to only said single throttle shaft, positioning said throttle valve relative to the surface of said induction passage means as to have the peripheral edge of said throttle valve within a preselected spaced relationship to said surface of said induction passage means, and fixedly securing said throttle valve to only said single throttle shaft for rotation therewith about said axis.

4,561,159
ADAPTER FOR REMOVING DIESEL ENGINE FUEL INJECTORS

David V. Schuster, 1568 Cohassett Ave., Lakewood, Ohio 44107

Filed Feb. 23, 1984, Ser. No. 582,828
Int. Cl.[4] B25B *19/00*
U.S. Cl. 29—255 **2 Claims**

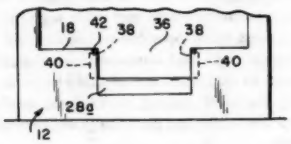


1. An adapter for a tool utilized for engaging fuel injector nozzles or the like comprising a sleeve member having a longitudinally extending opening therein throughout its entire length, said longitudinally extending opening comprising a first longitudinally extending opening and a second longitudinally extending opening, said first and second longitudinally extending openings being contiguous and joined at a location intermediate the ends of said sleeve member, said first longitudinally extending opening being located adjacent one end of said sleeve member and having a transverse width less than the transverse width of said second longitudinally extending opening, a pocket provided in said one end of said sleeve member, said pocket having a longitudinally extending opening therein coincident with said first longitudinally extending opening in said sleeve member and having a plurality of longitudinally extending side surfaces and a base surface complementary to the configuration of a portion of the fuel injector nozzle to be engaged permitting the surfaces defining the sides of the portion of the fuel injector nozzle and a transverse surface thereon to be engageable with said complementary longitudinally extending side surfaces and said base surface of said pocket, and means for attaching said sleeve member to the removal tool, said attaching means being removably attachable to the other end of said sleeve member.

4,561,160
METHOD OF ALTERING A CONVENTIONAL TUB FOR THE HANDICAPPED

Paul G. Nicol, 285 Bradford Ter., Manomet, Mass. 02345, and William W. Nicol, 3D Markham Cir., Ayer, Mass. 01432

Filed Oct. 12, 1984, Ser. No. 660,493
Int. Cl.[4] B23P *7/00*
U.S. Cl. 29—401.1 **4 Claims**



1. The method of altering a conventional tub for the handicapped comprising removing a generally rectangular section of a wall of a tub having spaced-apart inner and outer side walls extending from the rim down to a level above the bottom which is more than half the height of the wall, thus defining an opening in the wall, the bottom of which is above the bottom of the tub, reducing the depth of the removed section to less than half its original depth, replacing the reduced section in the opening at the bottom, filling the sides of the openings betwen

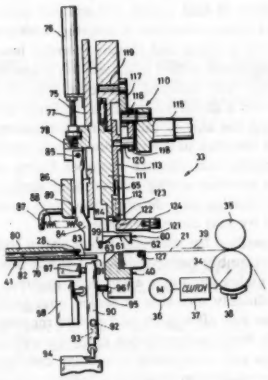
the inner and outer side walls of the wall from the rim down to the replaced section and finishing the sides and bottom of the opening with a compound comparable with the finish of the tub.

4,561,161

METHOD OF AND APPARATUS FOR AUTOMATICALLY ATTACHING TOP STOPS TO A GAPPED SLIDE FASTENER CHAIN WITH SLIDES MOUNTED THEREON

Toyoo Morita, Uozu, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Continuation of Ser. No. 473,542, Mar. 9, 1983, abandoned. This application May 23, 1985, Ser. No. 737,566
Claims priority, application Japan, Mar. 17, 1982, 57-42209
Int. Cl.⁴ B21D *53/56*
U.S. Cl. 29—408 **8 Claims**



3. An apparatus for automatically attaching top stops to a longitudinally gapped, continuous slide fastener chain composed of a pair of stringer tapes, pairs of rows coupling elements mounted respectively on the stringer tapes and longitudinally spaced with gaps therebetween, bottom stops attached respectively to the pairs of rows of coupling elements at ends thereof, and sliders slidably mounted respectively on the pairs of rows of coupling elements, said apparatus comprising:

(a) means for longitudinally feeding the slide fastener chain along a path in one direction;

(b) a pair of spaced front and rear chain guides disposed in said path for guiding the slide fastener chain to move along the path, said front guide having stationary clinching dies;

(c) a slider sensor on said front guide for sensing the slider on one of the pairs of rows of coupling elements for stopping said feed means;

(d) an apertured chain opening and clamping pad disposed above and movable downwardly to said front chain guide and having depending legs for spreading and then clamping the stringer tapes horizontally from each other at one of the gaps adjacent to said slider in response to the sensing of the latter by said slider sensor;

(e) a chain stop lever supported for vertical and pivotal movement and it also being responsive to said slider sensor for being moved downwardly into said one gap and disposed between said front and rear chain guides and arranged to restart said feed means, said lever being pivotable by the bottom stop adjacent to said one of the gaps and having a connection for restopping said feed means;

(f) a chain deflector disposed between said chain stop lever and said front chain guide and actuatable, in response to the restopping of the slide fastener chain, for laterally deflecting a non-clamped area of the element-free portion of the slide fastener chain to thereby reversely move said one of the pairs of rows of coupling elements longitudinally onto said stationary clinching dies; and

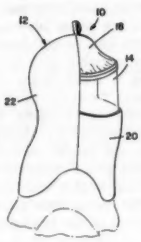
(g) a top stop applicator for thereafter acting through the aperture of said chain pad for applying top stops to the end of said stringer tapes clamped by said pad against said stationary clinching dies.

4,561,162

METHOD OF MAKING LOOSE FITTING SUPPLIED AIR RESPIRATION HOOD

Brock F. Brockway, Mill Valley; Anthony L. Moretti, San Rafael; Anselmo P. Pellolio, Cotati, and Jimmie Rasmussen, Petaluma, all of Calif., assignors to E. D. Bullard Company, Sausalito, Calif.

Division of Ser. No. 457,527, Jan. 13, 1983, Pat. No. 4,484,575. This application Jun. 4, 1984, Ser. No. 616,670
Int. Cl.⁴ B21D *39/03;* **B23P** *11/00*
U.S. Cl. 29—428 **5 Claims**



1. The method of making a loose fitting respirator hood consisting essentially of the steps of:

(a) forming a generally rectangular optical lens panel of thin, resilient, non-stretchable, air-impervious material transparent to a given range of light with a first pair of the side edges thereof normally lying substantially in a first plane;

(b) forming a mounting member of flaccid, non-stretchable, air-impervious material;

(c) sealingly fixing a first one of a second pair of side edges of said lens panel to said mounting member along a curved line in a second plane normal to said first plane;

(d) forming a skirt of flaccid, air-impervious material and sealingly fixing said skirt to a second one of said second pair of side edges of said lens panel opposite said first one of said second pair of side edges thereof;

(e) forming a back panel of flaccid, air-impervious material and sealingly fixing each of the side edges of said back panel to a different one of the side edges of said first pair of side edges of said lens panel and to a corresponding edge of said skirt member;

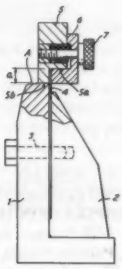
(f) sealingly fixing edges of said mounting member to said back panel to form a hollow generally tubular structure closed at one end; and

(g) providing means supplying pre-filtered air to the interior of said hood.

4,561,163
FITTING DOCTOR BLADES

Norman V. Cox, 43 W. Valley Rd., Hemel Hempstead, Hertfordshire, England

PCT No. PCT/GB82/00252, § 371 Date Apr. 18, 1983, § 102(e) Date Apr. 18, 1983, PCT Pub. No. WO83/00655, PCT Pub. Date Mar. 3, 1983
PCT Filed Aug. 13, 1982, Ser. No. 495,343
Claims priority, application United Kingdom, Aug. 18, 1981, 8125242
Int. Cl.⁴ B23Q 3/00
U.S. Cl. 29—464 6 Claims



1. A guide means, for use in fitting a strip-like doctor blade, having first and second parallel edges, into clamp means of a printing machine, said guide means including:

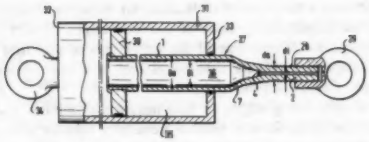
(i) an elongated guide member with a first linear stop surface to be abutted by said first edge of the blade, a second linear stop surface parallel to and spaced, from said first stop surface, and a plane blade gripping face disposed between said first and second linear stop surfaces,

(ii) holding means movable with respect to the guide member and having a plane blade gripping face movable towards and away from the plane blade gripping face of the guide member for holding the blade, wherein the holding means comprises a plurality of holders disposed at intervals along the guide member, each holder being connected to the guide member by a respective screw engaged with the holder and threaded into the guide member, such that rotation of the screw causes the plane blade gripping face of the holder to be moved parallel to the axis of the screw towards or away from the parallel plane blade gripping face of the guide member in a direction normal to those plane faces.

4,561,164
METHOD OF MAKING PISTON ROD FOR SHOCK ABSORBERS

Felix Wössner, Schweinfurt; Hermann Itzinger, Dittelbrunn, and Leopold Schöpplein, Schweinfurt, all of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Continuation of Ser. No. 313,676, Oct. 21, 1981, abandoned.
This application Feb. 6, 1984, Ser. No. 577,315
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1980, 3040652
Int. Cl.⁴ B21D 39/00; B23P 11/00
U.S. Cl. 29—510 9 Claims



1. In a method for making a metal piston rod for a piston and cylinder assembly particularly in a shock absorber device for motor vehicles including a cylinder member having a piston member slidable movable in sealed engagement therein with said piston rod affixed to said piston member and extending outwardly from said cylinder member with one end thereof, said piston rod comprising a tubular configuration having a circular cross-section defining a hollow interior exposed at an end opposite said one end to the interior of said cylinder member, a tubular extension at said one end adapted to be fastened to an associated structural member externally of said cylinder member and a closure member having a circular cross-section provided within said tubular extension in sealing interference engagement therein sealing said hollow interior of said piston rod at said opposite end, the improvement comprising the steps of providing a closure member made of steel and having a smooth outer surface at least along the portion thereof provided within said tubular extension and deforming said tubular extension, and shaping it into a reduced diameter thickened wall portion of said piston rod around said closure member while said closure member is inserted within said hollow interior thereby to place said closure member into sealing interference engagement within said reduced diameter portion of said piston rod, said reduced diameter tubular extension being formed with a diameter which is uniform about and substantially along the axis of said tubular extension, and securing a structural member to the exterior of said thickened wall tubular extension, said closure member being the only surface treatment member acting on the inner surface of said tubular extension during said deformation, said inner surface being smoothed by said closure member.

9. In a method for making a metal piston rod for a piston and cylinder assembly particularly in a shock absorber device for motor vehicles including a cylinder member having a piston member slidably movable in sealed engagement therein with said piston rod affixed to said piston member and extending outwardly from said cylinder member with one end thereof, said piston rod comprising a tubular configuration having a circular cross-section defining a hollow interior exposed at an end opposite said one end to the interior of said cylinder member, a tubular extension at said one end adapted to be fastened to an associated structural member externally of said cylinder member and a closure member having a circular cross-section provided within said tubular extension in sealing interference engagement therein sealing said hollow exterior of said piston rod at said opposite end, the improvement comprising the steps of providing a closure member made of plastic and having a smooth outer surface at least along the portion thereof provided within said tubular extension, deforming said tubular extension and shaping it into a reduced diameter thickened wall portion of said piston rod around said closure member while said closure member is inserted within said hollow interior thereby to place said closure member into sealing interference engagement within said reduced diameter portion of said piston rod, said reduced diameter tubular extension being formed with a diameter which is uniform about and substantially along the axis of said tubular extension and securing a structural member to the exterior of said thickened wall tubular extension.

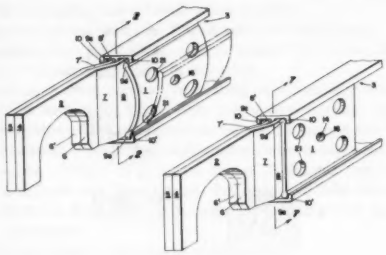
4,561,165
METHOD AND APPARATUS FOR MAKING HOOK TO RAIL CONNECTION FOR SCAFFOLDS OR THE LIKE

Thomas E. Bayer, Girard, Pa., assignor to R. D. Werner Co., Inc., Greenville, Pa.

Filed Jun. 4, 1984, Ser. No. 616,860
Int. Cl.⁴ B21D 39/00; E06C 7/16; B25G 3/20
U.S. Cl. 29—522 R 5 Claims

1. Apparatus for securing an offset hook having a web attachment portion to an I-beam having upper and lower end flanges, said apparatus comprising brace means of ductile material and of substantially C-shape form, said brace means adapted to be interposed between the lower end flanges of said

beam and the hook portion attached to the web of the beam, and means for applying force to a medial portion of said brace to flatten and extend the brace causing the brace to rotate and



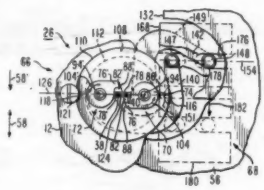
be wedged between the upper and lower end flanges of the beam and to fill a gap between the hook portion attached to the web of the beam and to reinforce the hook-to-beam connection.

4,561,166

COMPONENT LEAD PROCESSING APPARATUS

George J. Whitley, Philadelphia, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 14, 1984, Ser. No. 589,330
Int. Cl.[4] B23Q *41/00*; H05K *13/04*
U.S. Cl. 29—566.3 **11 Claims**



7. A component lead processing apparatus comprising:

support means for supporting and aligning a printed circuit board relative thereto; and

lead processing means coupled and aligned relative to the support means for processing a plurality of component leads borne by an aligned printed circuit board;

said lead processing means comprising:

a stationary member secured to the support means, said member having a pair of spaced bearing apertures having parallel bearing axes and a lead receiving aperture between the bearing apertures,

first and second lead processing elements, the first element in one bearing aperture, the second element in the other bearing aperture, said lead processing elements each including a lead processing head cooperating with said stationary member to process a corresponding lead inserted in said lead receiving aperture, each said lead processing head rotating about its axis corresponding to its bearing aperture, said heads being tangentially closely spaced in at least one angular orientation relative to their respective axes, and

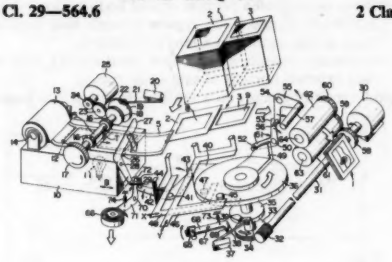
drive means coupled to the support means for concurrently rotating said first and second lead processing heads in opposite tangential directions, first in one sense and then in a second opposite sense.

4,561,167

FILM MOUNTING DEVICE

Kaneo Saito, Hino, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Nov. 14, 1983, Ser. No. 551,064
Claims priority, application Japan, Nov. 18, 1982, 57-202738
Int. Cl.[4] B23Q *7/00*
U.S. Cl. 29—564.6 **2 Claims**



1. A film mounting device comprising:

a stocking means for stocking a mounting frame at a predetermined stocking position, said mounting frame being constituted by a pair of foldable main and auxiliary plates,

a mounting frame setting means, including first cam means, for transferring said mounting frame from said stocking position to a mounting position by said first cam means,

a film feeding means, including a detecting means, for feeding a developed film to be set in place one frame at a time in said mounting frame by said detecting means,

a film cutting means for cutting one frame of the film fed out by said film feeding means,

a mounting frame folding means, including a folding rod and second cam means, for fitting said film into the main plate of said mounting frame and folding the auxiliary plate of said mounting frame on said main plate by means of said folding rod which is driven by said second cam means,

and rollers for finally pressing said auxiliary plate to said main plate intimately.

4,561,168

METHOD OF MAKING SHADOW ISOLATED METAL DMOS FET DEVICE

Dorman C. Pitzer, Sunnyvale, and Edward J. Rice, Los Gatos, both of Calif., assignors to Siliconix Incorporated, Santa Clara, Calif.

Filed Nov. 22, 1982, Ser. No. 443,765
Int. Cl.[4] H01L *21/22*
U.S. Cl. 29—571 **24 Claims**

1. The method of forming a MOS transistor comprising the steps of:

forming an insulation layer on the surface of a first semiconductor region of a first conductivity type;

forming within said first semiconductor region a body region of a second conductivity type opposite said first conductivity type, the steps of forming said body region comprising

masking and selectively removing a portion of said insulation layer, thereby leaving an exposed portion of said first semiconductor region,

introducing dopants of said second conductivity type into said exposed portion of said first semiconductor region to a first density level,

diffusing said dopants of said second conductivity type into said first semiconductor region,

removing portions of said insulation layer,

forming a layer of gate oxide,

masking and selectively removing said layer of gate oxide,

thereby leaving exposed portions of said first conductive region and said body region,

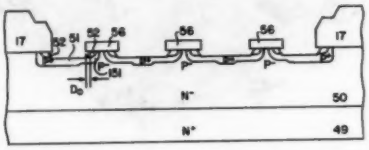
introducing dopants of said second conductivity type into said exposed portions of said first conductive region and said body region to a second density level,

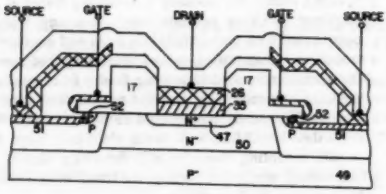
again diffusing said dopants of said second conductivity type;

etching said exposed portion of said body region wherein a portion of said body region beneath said insulation layer is also etched in a lateral direction;

introducing dopants of said first conductivity type into said exposed portion of said body region;

preferentially etching in a vertical direction said exposed





portion of said body region, thereby removing said dopants of said first conductivity type from within that portion of said body region which is not located beneath said insulation layer, and thereby leaving said dopants of said first conductivity type beneath said insulating layer to form a source region; and

forming a conductive layer on the surface of said MOS transistor, thereby simultaneously forming a gate electrode on the surface of said insulation layer, and a source electrode on said exposed portion of said body region and said source region, said source electrode extending beneath said insulation layer, wherein said gate electrode is physically and electrically separated from said source electrode.

4,561,169

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE UTILIZING MULTILAYER MASK

Masaru Miyazaki, Ohme; Susumu Takahashi, Nishitama; Takahiro Kohashi, Tsukui, and Kiichi Ueyanagi, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

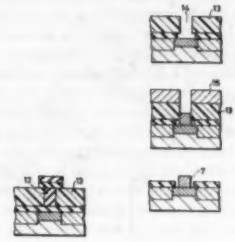
Filed Jul. 26, 1983, Ser. No. 517,409

Claims priority, application Japan, Jul. 30, 1982, 57-131929; Aug. 30, 1982, 57-149225

Int. Cl.⁴ H01L *21/441*

U.S. Cl. 29—571 **36 Claims**

1. A method of manufacturing a semiconductor device comprising the steps of forming a pattern at a gate electrode position on a predetermined semiconductor body, the pattern including at least two regions of an upper layer and a lower layer, the lower layer being made of a non-conductive material, the upper layer being wider than the lower layer; forming first and second impurity regions on both sides of a gate region by ion implantation by employing at least the pattern as a mask; forming a layer of a material on the substrate in a manner to bury at least the lower layer, the material having a selectivity in etching characteristics with respect to a material of the pattern; subsequently removing said pattern, and forming a reversal pattern of at least said lower layer; evaporating a metal layer for a gate electrode, employing said reversal pat-



tern of at least said lower layer as a mask; removing the material layer having the selectivity in etching characteristics with respect to the pattern material; and forming respective electrodes in contact with said first and second impurity regions.

4,561,170

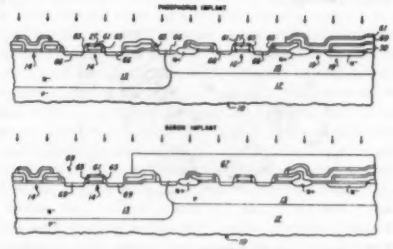
METHOD OF MAKING FIELD-PLATE ISOLATED CMOS DEVICES

Robert R. Doering, Plano, and Gregory J. Armstrong, Houston, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 2, 1984, Ser. No. 626,572

Int. Cl.⁴ H01L *21/263, 29/78, 27/04*

U.S. Cl. 29—571 **10 Claims**



1. A method of making a CMOS twin-well semiconductor device, comprising the steps of:

implanting N impurity into a face of a P type silicon body creating at least one N well area and growing oxide over said area,

implanting P impurity into said face using said oxide as a mask to create at least one P well area, heat treatments driving both said N well and P well into said face,

forming an oxidation mask on said face over both the N well and P well and opening holes in the oxidation mask over selected areas of the P well, then implanting N+ impurity in said selected areas and growing oxide over the selected areas to create buried N+ regions beneath such oxide, then implanting lighter doped N regions in at least one capacitor area of the P well,

applying a first conductive coating over said face and patterning it to provide capacitor plates and an isolation field-plate, said first conductive coating being insulated from the face in said at least one capacitor area by a thermal oxide thinner than an oxide coating in field plate areas,

applying a second conductive coating to said face isolated from said first conductive coating by an insulator, and

patterning the second conductive coating to provide transistor gates and interconnects,

forming sidewall oxide spacers on edges of said gates,

implanting N impurity into said face in both the N well and P well areas to create N+ source/drain regions, masked by said gates and sidewall oxide spacers,

masking said at least one P well area and implanting a impurity into the N well area to create P+ source/drain regions counterdoping said N impurity,

applying a third conductive coating over said face isolated from said second and first conductive coatings by an insulator except at contact areas, and patterning the third conductive coating to define interconnects and contacts,

wherein isolation of at least a pair of N-channel transistors along said face, from one another, is by said field-plate and no thick field oxide is formed for isolating said pair of transistors,

said field-plate being biased at zero volts.

4,561,171

PROCESS OF GETTERING SEMICONDUCTOR DEVICES

Viktor Schlosser, Vienna, Austria, assignor to Shell Austria Aktiengesellschaft, Vienna, Austria

Filed Apr. 1, 1983, Ser. No. 481,396

Claims priority, application Austria, Apr. 6, 1982, 1366/82

Int. Cl.⁴ H01L *21/20, 21/322*

U.S. Cl. 29—572 **21 Claims**

1. Process for gettering a semiconductor device comprising the following steps:

(1) applying a getter layer of amorphous or microcrystalline silicon onto the upper surface of the device to form a coated device;

(2) thermally treating the coated device; and

(3) removing the getter layer.

4,561,172

INTEGRATED CIRCUIT FABRICATION METHOD UTILIZING SELECTIVE ETCHING AND OXIDATION TO FORM ISOLATION REGIONS

Christopher Slawinski, Dallas; Robert R. Doering, and Clarence W. Teng, both of Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 15, 1984, Ser. No. 621,023

Int. Cl.⁴ H01L *21/302, 21/76*

U.S. Cl. 29—576 W **12 Claims**

1. A method for fabrication of integrated circuits, comprising the steps of:

(a) providing a monocrystalline silicon substrate;

(b) covering predetermined portions of said substrate with the first patterned composite layer, comprising a silicon nitride layer and a buffer layer over said silicon nitride layer remote from said substrate;

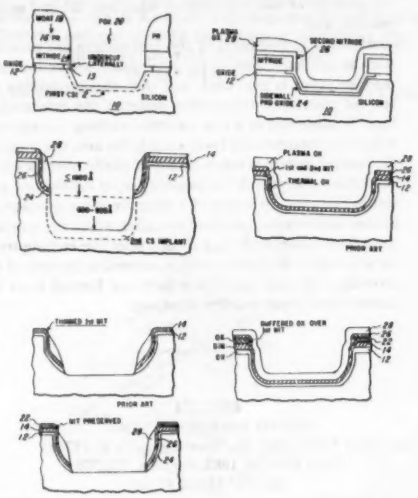
(c) anisotropically etching a recess in said substrate where not covered by said first patterned composite layer;

(d) depositing a sidewall oxide masking layer to cover the sidewalls and bottom of said recess,

(e) anisotropically etching said sidewall oxide masking layer from said bottom and a portion of said sidewalls to substantially clear the bottom of said recess;

(f) oxidizing exposed portions of silicon to form isolation oxide in said recess;

(g) removing remaining portions of said first composite layer; and



(h) forming desired active devices in portions of said substrate formerly covered by said first composite layer.

4,561,173

METHOD OF MANUFACTURING A WIRING SYSTEM

Ties S. Te Velde, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

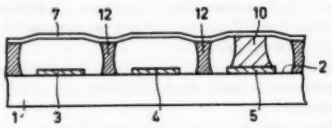
Continuation of Ser. No. 084,038, Oct. 12, 1979, abandoned.

This application Jun. 7, 1983, Ser. No. 500,791

Claims priority, application Netherlands, Nov. 14, 1978, 7811227

Int. Cl.⁴ H01L *21/90*

U.S. Cl. 29—577 C **2 Claims**



1. A method of manufacturing a wiring system on a supporting body having a major surface, which comprises:

providing a first pattern of electrically conductive material on said major surface;

providing an intermediate layer over substantially the entire major surface;

providing a second pattern of electrically conductive material having at least one track crossing the first pattern, said intermediate layer being provided by electrodeposition and being of a material which can be etched selectively with respect to both said first and second patterns;

providing a recess between said first pattern and said intermediate layer, said recess extending at least below said crossing;

then selectively etching said intermediate layer using the second pattern as an etching mask, said intermediate layer being etched away both laterally and also on its lower side at said crossing due to etchant flowing in said recess to remove substantially all of said intermediate layer at said crossing, while at other areas beneath said second pattern

said intermediate layer is etched away only laterally to remove only part of said intermediate layer and form supporting parts for said second pattern from the remaining portions of said intermediate layer beneath said second pattern; and

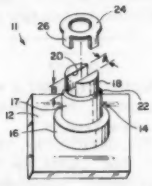
characterized in that parts of the first pattern are provided with an auxiliary layer of the same shape before the intermediate layer is provided, and that after providing the second pattern of conductive material the intermediate layer is subjected to a first selective etching treatment in which the intermediate layer outside the area the tracks of the second pattern is removed substantially over its whole thickness, after which the auxiliary layer on the first pattern is removed by means of a selective etching treatment so that said recesses are obtained, after which the intermediate layer is subjected to a second selective etching treatment in which the first pattern is exposed at the area of the crossings and said supporting parts are formed from the intermediate layer in other locations.

4,561,174

BRUSH ASSEMBLY TOOL

Elizor Gibli, 126 E. 23rd St., Huntington, N.Y. 11746

Filed Feb. 14, 1985, Ser. No. 701,778
Int. Cl.⁴ H01R *43/06*
U.S. Cl. 29—597 **4 Claims**



1. The method of properly positioning four spring loaded brushes within brush holders of a brush assembly housing having a central aperture prior to insertion of a motor armature through said central aperture of said brush assembly housing, said method comprises:

(a) pushing two opposite spring loaded brushes into proper position within said brush holders of said brush assembly housing;

(b) placing said central aperture of said brush assembly onto a reduced upper portion of a cylindrical post having a slot therein so that said two spring loaded brushes remain in proper position;

(c) pushing another two opposite spring loaded brushes that are in alignment with said slot into proper position within said brush holders of said brush assembly housing;

(d) pushing down said brush assembly housing until said brush assembly housing rests on a stop portion of said cylindrical post so that said four spring loaded brushes remain in proper position;

(e) placing a brush retainer upon said reduced upper portions of said cylindrical post;

(f) holding down said brush retainer when said brush assembly is removed from said cylindrical post so that said spring loaded brushes will apply pressure against said brush retainer and thus keep said brushes in proper position within said brush holders in said brush assembly housing; and

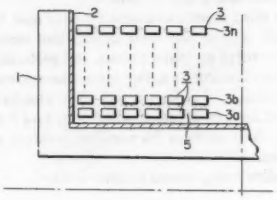
(g) pushing said motor armature through said central aperture which removes and replaces said brush retainer to hold said four brushes in proper position.

4,561,175

METHOD OF WINDING A SUPERCONDUCTING COIL

Yoichi Kawasumi, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 20, 1983, Ser. No. 534,112
Claims priority, application Japan, Nov. 30, 1982, 57-211618
Int. Cl.⁴ H01F *7/06;* **H01L** *39/24*
U.S. Cl. 29—605 **3 Claims**



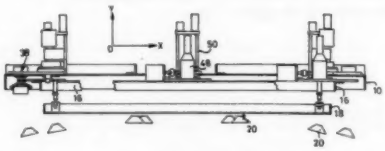
1. A method of winding a superconductive coil comprising the steps of winding the superconductive coil on a bobbin in a plurality of layers using a first filler between the conductors of each layer, and replacing the first filler with a normally temperature setting silicon compound second filler as a regulating and fixing means between the conductors of said coil.

4,561,176

SIX-AXIS HEAD FOR CORRECTION OF MOVEMENTS

Philippe Leddet, Croissy sur Seine, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Dec. 24, 1984, Ser. No. 685,773
Claims priority, application France, Dec. 23, 1983, 83 20655
Int. Cl.⁴ B23P *21/00;* **B23Q** *15/00;* **B25J** *11/00, 15/06*
U.S. Cl. 29—709 **8 Claims**



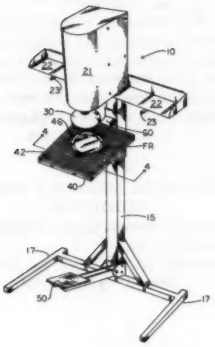
1. Six-axis head for correction of movements equipping a mobile tool (12) particularly for mating assembly of an element on a support equipped, on the one hand, with means (20) for holding the element and, on the other hand, with sensors (C_1, C_2) detecting the proximity of the support and delivering control signals to the means for driving the mobile assembly tool to position it correctly in relation to the support, characterized in that it comprises an upper frame (10) fastened to the mobile assembly tool defining a first geometric plane P_1, an intermediate frame (16) defining a second geometric plane P_2 and connected to the upper frame (10) by first drive means (M_1, M_2, M_3) making it possible to make two translations (T_{X1}, T_{Y1}) of plane P_2 parallel to plane P_1 along two orthogonal axes (O_{X1}, O_{Y1}) of plane P_1 and a rotation (R_{Z1}) of plane P_2 around an axis (O_{Z1}) orthogonal to plane P_1, a lower frame (18) defining a third geometric plane P_3 and connected to the intermediate frame (16) by second drive means (M_4, M_5, M_6) making it possible to make a translation (T_{Z2}) of plane P_3 in relation to plane P_2 along an axis (O_{Z2}) orthogonal to plane P_2 and two rotations (R_{X2}, R_{Y2}) of plane P_3 around two orthogonal axes (O_{X2}, O_{Y2}) of plane P_2, the means (20) for holding the element being fastened to the lower frame (18), said signals delivered by the proximity sensors also being delivered to the means for controlling the first and second drive means.

4,561,177

APPARATUS FOR FRAMING FABRIC IN EMBROIDERY HOOPS

Karl E. Rancer, Rte. 2, Box 310A, Stokesdale, N.C. 27357

Filed Sep. 14, 1984, Ser. No. 650,432
Int. Cl.[4] B23P *21/00*; B23Q *15/00*
U.S. Cl. 29—721 8 Claims



1. Apparatus for framing sheets of textile fabric or flexible material between mating inner male and outer female rings of an embroidery hoop in preparation for an embroidering operation to be performed on the fabric or material, said apparatus comprising:

(a) a planar support member having receiving means associated therewith for removably positioning and retaining one of said outer, female rings of said embroidery hoop thereon in a receiving position in which said one female ring is arranged at a prescribed orientation;

(b) insertion means for releasably receiving and retaining said male ring thereon;

(c) said insertion means being aligned with said receiving means and being movable between a first position in which said insertion means is retracted from said receiving means and a second position in which said insertion means is extended into an emplacement position where said male ring is moved into frictional engagement with said female ring with said material therebetween;

(d) activating means for urging said insertion means between said first and second positions;

(e) a substantially vertical support frame, with said planar support member being stationarily, but adjustably mounted on said support frame at an intermediate position; said insertion means being movably mounted on said support frame at an upper position above said planar support member; and said activating means being carried by said support frame, said activating means comprising a reciprocating linkage connected at one end to said insertion means and at the other end to an operative foot pedal;

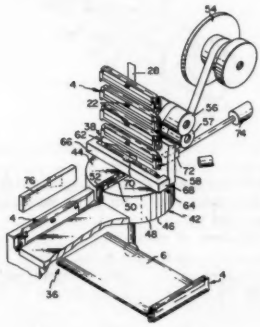
whereby, after said female ring is positioned on said planar support member, and a sheet of fabric or material has been stretched thereacross, said reciprocating means is activated by said foot pedal to reciprocate said insertion means downwardly to insert said male ring.

4,561,178

APPARATUS FOR INSTALLING CONNECTORS ON FLAT CABLE HAVING AUTOMATIC CONNECTOR DELIVERY SYSTEM AND SELECTIVE ORIENTATION FEATURE FOR THE CONNECTORS

Lodevicus L. J. van de Kerkhof, 's-Hertogenbosch, Fed. Rep. of Germany, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 25, 1984, Ser. No. 664,805
Int. Cl.[4] B23P *19/00*
U.S. Cl. 29—749 11 Claims



1. Apparatus for installing electrical connectors on flat cables, the cables having a plurality of conductors in side-by-side parallel relationship, the connectors being of the type comprising an insulating housing having oppositely directed faces, oppositely facing first and second sidewalls, and oppositely facing first and second endwalls, the endwalls and the sidewalls extending perpendiculary of the faces, the apparatus being of the type having an application zone, a housing applicator in the application zone for installing a housing in the application zone on a cable which is presented to the application zone, a staging zone which is spaced from the application zone, a housing guide track for guiding the housings from the staging zone into the application zone with the housing sidewalls parallel to the guide track, a housing transporter for moving a housing from the staging zone along the guide track into the application zone, and a housing delivery system for delivering housings to the staging zone, the apparatus being characterized in that:

a turntable is provided in the staging zone, the turntable having first and second major surfaces and having a circumferential surface, a housing receiving recess extends diametrically across the first major surface and has open first and second ends at the circumferential surface, the housing delivery system being effective serially to deliver housing to the housing-receiving recess with the first and second ends of a housing in the housing-receiving recess being adjacent to the first and second ends of the housing-receiving recess respectively,

a turntable rotating means is provided for rotating the turntable through an angle of 180 degrees about an axis of rotation which extends centrally through the turntable whereby,

a housing delivered to the housing-receiving recess can be moved by the housing transporter along the guide track and into the application zone with the first endwall on the leading end or the secod endwall on the leading end of the housing.

4,561,179

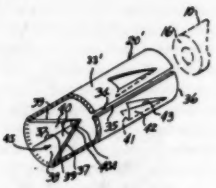
METHOD FOR ELECTRICAL CONNECTION TO THE CENTER CONDUCTOR OF AN INSULATED WIRE

Robert W. Brush, Jr., North Brunswick, N.J., and Robert D. Waghorn, Oneonta, N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 505,651, Jun. 20, 1983. This application Aug. 6, 1984, Ser. No. 637,990

Int. Cl.⁴ H01R *43/04*

U.S. Cl. 29—866 **2 Claims**



1. A method of making an electrical terminal for electrical connection to the center conductor of an insulated wire, said method characterized by:

stamping a flat sheet of metal into an elongated generally rectangular shape, said sheet being defined by a pair of longitudinal edges and by a pair of lateral edges,

cutting into the sheet to form a plurality of V-shaped fins,

forming a plurality of V-shaped sheet portions along one lateral edge, each V-shaped sheet portion including lateral edge portions which terminate in a tip portion,

bending each of said V-shaped fins upwardly from the plane of the sheet so as to be longitudinally extending and substantially perpendicular thereto,

folding each of said V-shaped tip portions upwardly from the plane of the sheet and then downwardly towards the plane of the sheet so that the tip portions are pointing towards the fins, and

rolling said sheet into a tubular sleeve by progressively bending the longitudinal edges around to a position where said longitudinal edges adjoin at a seam, said rolling disposing said fins and said V-shaped tip portions internally of said sleeve, said fins being disposed in a longitudinal plane passing through the primary axis of the sleeve, and said V-shaped tip portions converging together to form a conical spike the axis of which is generally coaxial to the sleeve.

4,561,180

APPARATUS FOR CUTTING VEGETATION WITH INCREMENTAL FEEDING OF CUTTING FILAMENT

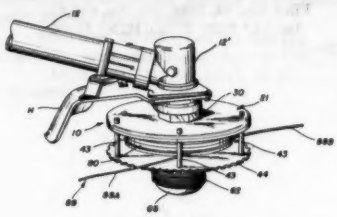
Charles B. Pittinger, Sr.; Cynthia A. Pittinger, both of 902 North Lake Dr., Weatherford, Tex. 76086, and Charles B. Pittinger, Jr., 320 Cockeys Mill Rd., Reisterstown, Md. 21136

Filed Jun. 29, 1984, Ser. No. 626,218

Int. Cl.⁴ A01D *35/26*

U.S. Cl. 30—276 **32 Claims**

28. A vegetation cutting apparatus of the filament type comprising a cutter head including a spindle adapted to be rotatably driven, a keyway in said spindle extending axially of said spindle, a key member carried by said spindle and slidably movable in said keyway, a clutch means coaxially mounted on said spindle, a spool mounted on said spindle for storing the filament, said spool being keyed to and lying radially outwardly of said clutch means, means normally biasing said key member into driving engagement with said clutch means whereby normally said spindle rotatably drives said clutch means through said key member to thereby rotatably drive said spool, means for imparting axial movement to said key member along said keyway against said biasing means whereby to move said key member out of driving relation with respect to said clutch means, and thus whereby to transitorily interrupt the rotatable drive connection from said spindle to said spool through said clutch means whereby to permit an increment of said filament to be fed by centrifugal force from said spool, and



a circular cover plate mounted on said spindle beneath said spool, said cover plate being provided with saw-like teeth on its outer periphery for cutting heavy growth of vegetation.

4,561,181

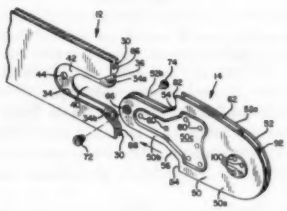
REPLACEABLE NOSE ASSEMBLY FOR CHAIN SAW GUIDE BAR

David J. Weisgerber, Gresham, Oreg., assignor to Omark Industries, Inc., Portland, Oreg.

Filed Sep. 23, 1982, Ser. No. 421,876

Int. Cl.⁴ B27B *17/04*

U.S. Cl. 30—387 **8 Claims**



4. A guide bar for a saw chain comprising an elongate main body section having a rear end attachable to a chain saw motor housing and an outer end spaced therefrom, a separate nose section, and means for releasably securing said nose section to the outer end of said body section,

said body section having opposed peripheral edges with a selected width therebetween and elongate grooves defined therein for receiving the drive tangs of a saw chain to guide the chain along the bar, the outer end portion of said main body section having outer end margins and recesses defined in opposed side faces thereof, an opening extends inwardly from the outer end margins of said main body section within the region of said recesses, and a central portion of said main body section between said recesses defining a flange paralleling the plane of said body section and extending about said opening,

said nose section having end margins and a width generally equal to the width of said outer end of said main body section with grooves along edge margin portions thereof generally aligned with the grooves in said body portion to receive the drive tangs of such chain, and a narrower tongue portion which projects rearwardly from said bar nose portion with an outline complementing said recesses in the opposite faces of said main body section for receipt therein and a groove defined in the outer edge of said tongue portion to receive said flange, and

opposed peripheral edge margins of said recesses in said body portion diverge progressively outwardly toward the outer end margins of said body section and said nose

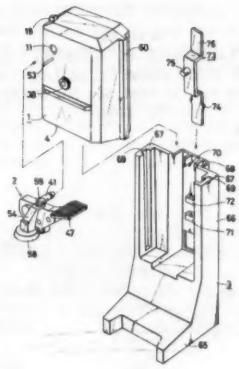
section has edge margin portions intermediate said tongue and nose portions which diverge at an angle complementary to the angle of divergence of the peripheral edges of said recesses but are slightly wider, said diverging edge margin portions of said nose section being positioned to bear against the diverging edge margins of said body section when assembled to aid in aligning said nose section relative to said body section.

4,561,182

ELECTRIC CAN OPENER

Osamu Yamamoto, Nagoya, and Senichiro Norizuki, Aichi, both of Japan, assignors to Kabushikikaisha Aichidenkikosakusho, Japan

Filed Nov. 10, 1983, Ser. No. 550,670
Claims priority, application Japan, May 25, 1983, 58-93091
Int. Cl.[4] B67B *7/30*
U.S. Cl. 30—433 **2 Claims**



1. A can opener comprising:

(a) a rectangular enclosure containing a motor, a gear rotated by said motor for rotating a can to be opened and a cutter for cutting the can top as the can is rotated;

(b) a support member for said enclosure having a bare and an upright rear wall and provided with a compartment for removably receiving said enclosure and removable means cooperating with the support member and enclosure for interlocking the enclosure and support member to form a single unit;

(c) means for removably and rigidly suspending the single unit from an overhead support

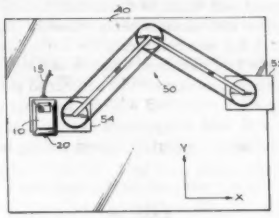
whereby the can opener can be operated with the support member mounted either on a vertical wall, a horizontal surface or when suspended from above wherein the compartment in the support member is a forwardly and upwardly open recess, the side walls of the recess being formed with oppositely facing elongated grooves, and the enclosure having vertically extending guides projecting from the opposite walls of the enclosure for slidable engagement with the grooves and wherein the removable means for interlocking the support member and enclosure when it is within the compartment includes bracket means secured to the rear wall of the recess, at least one opening in the rear wall of the enclosure, an elongated resilient member provided with lateral projections for interlocking with the bracket means and a forwardly directed projection extending said at least one into an opening.

4,561,183

TRACING AID FOR COMPUTER GRAPHICS

Marvin W. Shores, Pomona, Calif., assignor to General Dynamics Pomona Division, Pomona, Calif.

Filed Jul. 23, 1984, Ser. No. 633,566
Int. Cl.[4] G08C *21/00*
U.S. Cl. 33—1 M **31 Claims**



1. A tracing aid for use with a computer mouse to enable the use of said mouse in inputting a complex curve or profile from a drawing or photograph into a computer, comprising:

means for receiving said mouse, said receiving means holding said mouse for movement on a flat surface defined by two orthogonal lines;

said mouse being a translatable device including means for generating signals for application to a computer which are indicative of the instantaneous relative position of a point which is generally centrally located underneath the mouse and movable therewith;

means coupled to the receiving means and attachable to the flat surface for maintaining the angular attitude of said mouse with respect to said two orthogonal lines as said mouse moves over said flat surface; and

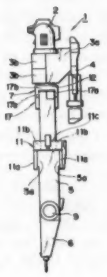
tracing means mounted in a predetermined fixed position relative to said point which is displaced laterally therefrom, said tracing means being movable with said mouse for manually tracing the locus of said complex curve or profile from said drawing or photograph to simultaneously input the locus of said complex curve or profile from the mouse into said computer.

4,561,184

SCHOOL UTENSIL AND TOY ROBOT

Takashi Fujitani, Tokyo, Japan, assignor to Kabushiki Kaisha Gakushu Kenkyusha, Tokyo, Japan

Filed Sep. 8, 1983, Ser. No. 530,263
Claims priority, application Japan, Apr. 28, 1983, 58-64301
Int. Cl.[4] A63H *3/00*; B43L *9/00*; B43K *24/02*
U.S. Cl. 33—27.02 **15 Claims**



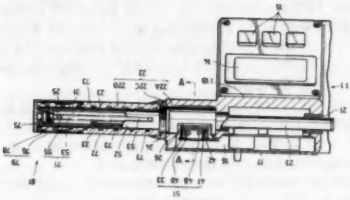
1. A school utensil and toy robot comprising a support constituting a nucleus of a robot body having aesthetically pleasing features to a child, said support including a base por-

tion and a rod portion extending upward from said base portion; a head means fixed onto the upper end of said rod portion; a trunk means joined to said rod portion of said support so as to surround the same in discrete relationship thereto; a pair of arm members joined to said trunk member; a shaft provided in said base portion of said support so as to extend perpendicular thereto; at least two leg members fitted by their upper end portions around said shaft; foot members having at least one flat surface, one foot member being movably attached to the bottom of each leg member; means for writing provided in at least one of the foot members; wherein said head, trunk, arm and foot members complement one another so as to be capable of simulating a toy robot and wherein said foot members are arrangeable with said flat surfaces against a generally level supporting surface to support the utensil and toy in a freestanding position.

4,561,185
MEASURING INSTRUMENT

Hideo Sakata, and Hiroshi Yamashiro, both of Kawasaki, Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Mar. 28, 1984, Ser. No. 594,091
Claims priority, application Japan, Mar. 31, 1983, 58-56479; Mar. 31, 1983, 58-56480
Int. Cl.[4] G01B *3/18*
U.S. Cl. 33—164 R **13 Claims**



1. In a measuring instrument wherein a displacement value of a spindle axially movable with respect to a main frame is detected by a displacement value detector to thereby measure dimensions, position and the like of a workpiece to be measured, the improvement comprising wherein:

said spindle is supported by said main frame through a first tubular member having a loose insertion groove, into which is loosely inserted an engageable member projected from said spindle in the radial direction; and

a spindle rotation locking means and a spindle driving mechanism are provided, said spindle rotation locking means comprising said engageable member and a second tubular member of a small wall thickness coupled and affixed onto said first tubular member and including an elongate groove blocked at opposite ends and having thereinto inserted the engageable member, guiding the engageable member in the axial direction of the spindle, said spindle driving mechanism including said engageable member and an outer tube having a spiral groove, with which said engageable member is engaged for moving said spindle, is rotatable relative to the main frame.

4,561,186
SAW GAGE

Arthur N. Keefe, 25 Grove St., Westboro, Mass. 01581

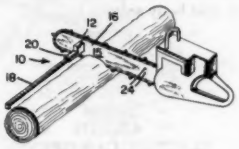
Filed Feb. 13, 1984, Ser. No. 579,377
Int. Cl.[4] B27B *17/02*; B27G *23/00*
U.S. Cl. 33—185 R **3 Claims**

1. In a chain saw having a bar, a gage for mounting on the surface of the bar comprising:

(a) a housing having a first and a second outer surface facing in opposite directions,

(b) a magnet extending from the first surface to engage the said surface of the bar,

(c) a hollow leg extending from the second surface of the housing, an opening in the second surface of said housing aligned with said hollow leg,



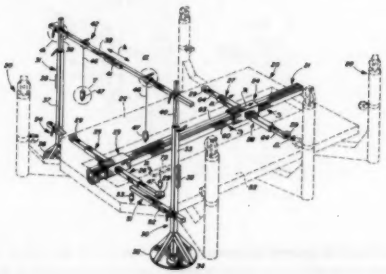
(d) a self-supporting tape enclosed in the housing and extending through said opening into and from the hollow leg, and

(e) two pegs extending from the said first surface of the housing to engage corresponding holes in the bar, said holes extending through said bar.

4,561,187
VEHICLE FRAME ALIGNMENT GAUGE

Robert F. Powell, 4809 Laketon Ct., St. Louis, Mo. 63128

Filed Apr. 23, 1984, Ser. No. 603,091
Int. Cl.[4] G01B *5/25*
U.S. Cl. 33—288 **2 Claims**



1. Measuring apparatus for facilitating the adjustment of a frame from a first shape to a second shape, said frame having reference points which are in

a first orientation with respect to one another when said frame has said first shape, and

a second orientation with respect to one another when said frame has said second shape, said frame having a centerline generally bisecting said frame when said reference points are in said second orientation,

said apparatus including

(a) an elongate datum member having a longitudinal axis and adapted to be placed below said frame in a position parallel to said centerline thereof such that when said frame is in said second orientation said longitudinal axis generally lies in a vertical plane passing through said centerline of said frame;

(b) a carriage slidably carried on said datum member for selective adjustment to positions therealong;

(c) first and second horizontally oriented colinear elongate datum bars mounted on said carriage, said datum bars each

(i) extending outwardly from said datum member in a direction opposite the direction in which said other datum bar extends from said datum member,

(ii) having an end remote from said datum member, and

(iii) being formed such that the distance of said remote end from said datum member can be selectively adjusted;

(d) plumb bob means attached to and suspended from each of said reference points on said frame, said plumb bob means having a pointed lower end remote from said frame; and,

(e) a generally circular target on said remote end of each of said datum bars, each of said targets being operatively associated with one of said plumb bob means and having

(i) an upper generally horizontally disposed circular planar surface with a centerpoint corresponding to the proper position of said pointed end of said associated plumb bob means when said distance of said target from said datum bar has been adjusted such that said centerpoint corresponds to the proper position of said pointed end of said associated plumb bob means when said frame is in said second shape, and

(ii) a lower surface,

said upper and lower surfaces co-terminating at a peripheral edge generally circumscribing said upper and lower surfaces and generally lying in an imaginary horizontally disposed plane, said centerpoint being generally equidistant from each point on said peripheral edge of said target,

said target permitting the ready visual determination of the spatial relationship of said centerpoint thereof and said pointed end of said plumb bob means operatively associated with said target when a user views said target

(iii) from a point above said horizontally disposed planar surface and can see said pointed end of said associated plumb bob means, said upper planar surface, said centerpoint, and a portion of said peripheral edge of said target, and

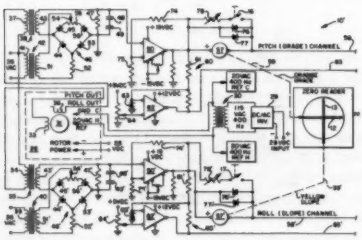
(iv) from the side of said target and can see said pointed end of said associated plumb bob means and a portion of said peripheral edge of said target and is unable to see said upper planar surface of said target.

4,561,188

GRADE AND SLOPE ATTITUDE GYROSCOPIC DRIVEN INDICATOR FOR HEAVY EARTH MOVING EQUIPMENT

Robert L. Williams, 1357 Kathryn Ct., Hurst, Tex. 76053, and James R. Garrett, 1836 Castille Dr., Carrollton, Tex. 75007

Filed Jan. 14, 1985, Ser. No. 691,391
Int. Cl.⁴ G01C *9/06*
U.S. Cl. 33—366 **18 Claims**



1. A grade and slope attitude gyroscopic driven indicator usable with earth moving equipment comprising:

a visual display instrument mountable on said equipment having a movable horizontal bar usable as a grade indicating bar, and a movable vertical bar usable as a slope indicating bar;

position reference indicator means on said instrument for said horizontal grade bar, and position reference indicator means on said intrument for said vertical slope bar;

first meter means operatively connected to move said horizontal grade bar;

second meter means operatively connected to move said vertical slope bar;

gyroscopic means for detecting the orientation of said equipment with respect to an inertial reference;

electronic grade pick off means from said gyroscopic means;

electronic slope pick off means from said gyroscopic means;

grade channel electronic signal sensing, amplifying and drive power means connected to said electronic grade pick off means and to said first meter means;

slope channel electronic signal sensing, amplifying and drive power means connected to said electronic slope pick off means and to said second meter means;

grade channel reference voltage switching means connected to said first meter means; and

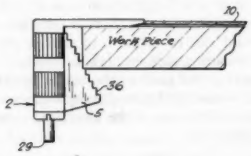
slope channel reference voltage switching means connected to said second meter means.

4,561,189

CHALKING LINE HOLDER

Paul J. Hirneise, 2203 SW. 72nd Ter., Gainesville, Fla. 32608

Filed May 6, 1985, Ser. No. 730,821
Int. Cl.⁴ B44D *3/00*
U.S. Cl. 33—408 **12 Claims**



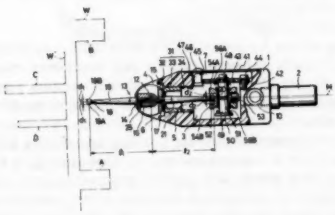
1. A chalking line retainer for holding one end of a chalking line on the surface to be marked with a chalk line, said retainer comprising a tubular member having a longitudinal axis, a toe plate of substantially flat configuration integral with said tubular member and including means for attaching one end of a chalking line, further means also integral with said tubular member lying substantially in a plane passing through the longitudinal axis of said tubular member and substantially perpendicular to said toe plate, said toe plate and further means cooperating with each other when the chalking line retainer is placed at the end of a work piece to hold the chalking line retainer and said one end of the chalking line in a fixed position with the chalking line in close proximity to the surface to be marked without puncturing or otherwise damaging the surface of the work piece.

4,561,190

TWO-DIRECTIONAL TOUCH SENSOR

Takeshi Yamamoto; Hideo Sakata, and Iwao Sugizaki, all of Kawasaki, Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Nov. 22, 1983, Ser. No. 557,293
Claims priority, application Japan, Mar. 31, 1982, 57-52825
Int. Cl.⁴ G01B *7/28*
U.S. Cl. 33—561 **16 Claims**



1. A two-directional touch sensor, comprising: a main body elongated in the direction of a neutral axis, an elongated probe

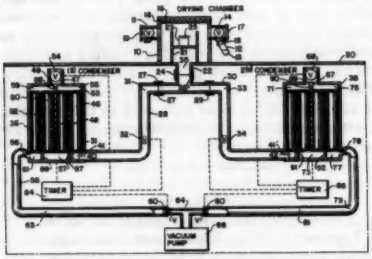
shaft rotatably supported on said main body and for movement solely about a nonmovable axis of rotation perpendicular to said neutral axis and the longitudinal axis of said probe shaft, said probe shaft having at one end thereof a measuring element symmetrical with the axis of said probe shaft and at the other end thereof a contacting element, a position control means for holding said probe shaft in said main body in such a manner that the axis of said probe shaft is normally colinearly aligned with said neutral axis, a pair of electric contact points each provided on said main body and positioned in the path of movement of said contacting element of said probe shaft, said contact element being interposed between said electric contact points, and a sensor means for sensing electric conduction between either one of said electric contact points and said contacting element, wherein, when said measuring element is moved in either one of two directions so that a surface portion on said measuring element becomes tangentially related to said neutral axis, said electric contact points will electrically contact said contacting element, and wherein said measuring element has a spherical shape, the center of which conincides with said longitudinal axis of said probe shaft, said contacting element having a pair of surface portions thereof spaced an equal distance from said longitudinal axis of said probe shaft, and wherein an equation $d_2=l_2/l_1 \cdot d_1$ is satisfied, where l_1 is a distance from said axis of rotation of said probe shaft to the center of said measuring element, l_2 is a distance from said axis of rotation of said probe shaft to the center of said contacting element, d_1 is a radius of the measuring element, and d_2 is an interval between either one of the electric contact points and the contacting element.

4,561,191

METHOD AND APPARATUS FOR CONTINUOUS FREEZE DRYING

Martin C. Parkinson, 6 N. Delaware Dr., Nyack, N.Y. 10960

Filed May 28, 1985, Ser. No. 738,378
Int. Cl.[4] F26B *5/06, 13/30*
U.S. Cl. 34—5 **28 Claims**



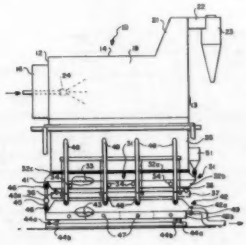
1. A freeze drying apparatus, comprising:
(A) A drying chamber means;
(B) At least two condenser means;
(C) A quantity of molecular sieve within each of said condenser means;
(D) A vacuum pump;
(E) Valving means for providing vacuum tight communication sequentially between each of said condenser means and said drying chamber means and said vacuum pump, and for opening each of said condenser means sequentially to atmospheric pressure; and
(F) Automatic control means for opening and closing valve positions in said valving means, so that during a first period of time when said vacuum pump is in operation said atmospheric pressure is reduced within said drying chamber means and the first of said condenser means, while a second condenser means is opened to said atmospheric pressure, said automatic control means further providing means for heating said molecular sieve within said second condenser means, so that vapors that have previously been adsorbed by said sieve within said second condenser means are driven out of said sieve in said second condenser means, and are expelled to the atmosphere through said opening to said atmospheric pressure in said second condenser means, said automatic control means further providing means for turning off said heating means for said sieve within said second condenser means in order to permit said sieve within said second condenser means to cool down, said automatic control means further providing, during a second period of time immediately following said first period of time, means for opening and closing valve positions in said valving means, so that when said vacuum pump is in operation, said pressure is continued to be reduced in said drying chamber, and said atmospheric pressure is reduced in said second condenser means, while said first condenser means is opened to said atmospheric pressure, said automatic control means further providing a means for heating said molecular sieve within said first condenser, so that condensable vapors that have previously been adsorbed by said sieve within said first condenser are driven out of said sieve within said first condenser, and are expelled to said atmosphere through said opening to said atmospheric pressure in said first condenser, said automatic control means further providing means for turning off said heating means for said sieve within said first condenser in order to permit said sieve within said first condenser to cool down, and then repeating, during a third period of time, the operations that occurred during said first period of time, and so on, so that adsorbable vapors diffusing from said drying chamber means are adsorbed by said molecular sieve in said condenser means on a continuous basis.

4,561,192

SPRAY DRYING APPARATUS AND METHOD

Reginald E. Meade, Tulare, Calif., assignor to Dairyman's Cooperative Creamery Assoc., Tulare, Calif.

Continuation-in-part of Ser. No. 445,051, Nov. 29, 1982, abandoned. This application Sep. 27, 1984, Ser. No. 654,958
Int. Cl.[4] F26B *3/08*
U.S. Cl. 34—10 **15 Claims**



7. A method of drying a fluid feed material making use of spray drying apparatus having a structure forming a horizontally extended main drying chamber with means for introducing drying gas and for introducing atomized particles of the feed material and for dispersing the particles in the gas, and means for discharging gas from the main drying chamber, the apparatus also including a unit of the fluidized bed type having a generally horizontal screen that is vibrated, the method comprising causing the atomized particles of the fluid bed to be introduced into one end portion of the main drying chamber and to be dispersed in the drying gas to partially dry the atomized particles, the drying gas being directed horizontally into the upper portion of the main drying chamber, causing the partially dried particles to progress downwardly without obstruction to form a fluidized bed extending over the screen of said fluidized bed unit, supplying drying gas to said unit below

the screen thereof whereby such gas progresses upwardly through the screen and the partially dried particles forming the fluidized bed of material thereon and from thence upwardly into the main chamber, continuously causing the finer powder particles of the fluidized bed to be separated from the fluidized bed by the drying gas progressing upwardly through the fluidized bed, co-mingling in the main drying chamber such finer particles with the atomized and partially dried material whereby such finer particles are caused to adhere to partially dried dispersed particles and returned to the fluidized bed, and continually discharging material from one end of the fluidized bed.

8. A method as in claim 7 in which the material discharged from the fluidized bed is subjected to further treatment in contact with a drying gas.

4,561,193

NOZZLE ARRANGEMENT FOR A VEHICLE DRYING INSTALLATION

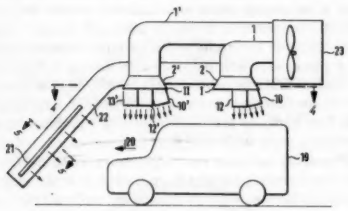
Horst Burger, Gartenstrasse 6 d, D-8902 Neusass, Fed. Rep. of Germany

Filed Nov. 14, 1984, Ser. No. 671,337

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1983, 8333776[U]

Int. Cl.[4] F26B *15/12*

U.S. Cl. 34—54 **21 Claims**



1. A nozzle arrangement for a vehicle drying installation of the type including conduit means for defining a path through which blown air travels and blower means operatively connected to said conduit means at one end thereof for blowing air through said conduit means from said one end to a discharge end thereof, said nozzle arrangement including opening-defining means defining a triangular grouping of plural openings communicable with said discharge end of said conduit means to permit said blown air to pass therethrough, and plural flange means rigidly associated with respective ones of said openings to direct said blown air onto a surface of the vehicle, said flange means by virtue of said triangular grouping of openings for establishing a generally V-shaped blown air curtain profile for impingement upon said vehicle surface such that relative movement between said vehicle and said blown air curtain profile along a predetermined direction of travel responsively effects blown movement of water upon said surface rearwardly and laterally relative to said direction of travel, wherein said opening-defining means includes a truncated conically-shaped transition member having a top circular opening fixable to said discharge end of said conduit means and a bottom opening, plate means fixed to said bottom opening and defining at least three circular openings therein, said at least three circular openings establishing said triangular grouping, wherein the total area of said at least three circular openings is substantially equal to the area of said top opening.

4,561,194

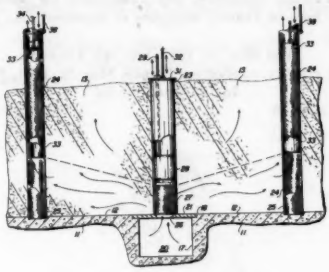
HAY DRYING FACILITY

George T. Sutch, Yuma, Ariz., assignor to Lawrence K. Bingham, Yuma, Ariz., a part interest

Filed Nov. 19, 1984, Ser. No. 672,665

Int. Cl.[4] F26B *9/02*

U.S. Cl. 34—229 **7 Claims**



1. A hay drying facility comprising means providing a substantially flat surface for supporting hay to be dried, a plurality of generally upright supply duct formers adapted to be disposed at spaced locations throughout the hay to be dried, said supply duct formers having spaced wall regions for creating a duct in the hay to admit a drying fluid to the hay, channel means disposed beneath said hay supporting surface for supplying a drying fluid to said supply duct formers, and a plurality of generally upright vent duct formers adapted to be disposed at spaced locations intermediate said supply duct formers, said vent duct formers having spaced foraminous wall regions for creating a duct in the hay to permit escape of some of the drying fluid therethrough upwardly from the hay, said supply duct formers and said vent duct formers being movable away from said hay supporting surface to clear said surface and facilitate removal of dried hay from said surface.

4,561,195

MIDSOLE ASSEMBLY FOR AN ATHLETIC SHOE

Kenji Onoda, Kajiwara, and Yukio Kawasima, Akashi, both of Japan, assignors to Mizuno Corporation, Osaka, Japan

Filed Aug. 12, 1983, Ser. No. 522,700

Claims priority, application Japan, Dec. 28, 1982, 57-197592[U]

Int. Cl.[4] A43B *13/12*

U.S. Cl. 36—30 R **8 Claims**

1. A midsole assembly for an athletic shoe, said midsole assembly comprising

a midsole including a toe region and a heel region,

a sheet having a higher modulus of longitudinal elasticity than that of the midsole, said sheet being integrally arranged in the midsole and said sheet being in a corrugated form in the longitudinal cross-section of the midsole assembly, and

a height of the corrugation of said sheet located in the heel region being larger than a height of the corrugation of said

sheet located in the toe region for preventing excessive compression of said midsole.

4,561,196

SKI BOOT HAVING UPPER WITH JOURNALLED DISTRIBUTION PLATE

Roland Petrini, Chambéry, and Jean-Louis De Marchi, Faverges, both of France, assignors to Salomon S.A., Annecy, France

Filed May 10, 1982, Ser. No. 376,653
Claims priority, application France, May 22, 1981, 81 10671
Int. Cl.[4] A43B 5/04
U.S. Cl. 36—118 **37 Claims**

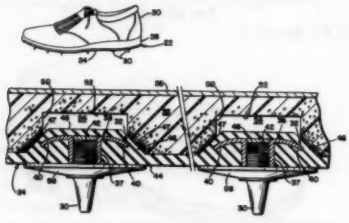
1. A ski boot having a rigid shell base adapted to surround the foot of the skier and an upper adapted to surround the bottom of the leg of the skier, wherein said upper comprises a front cuff, wherein said front cuff is journaled along a first axis on said shell base, wherein said upper further comprises means for distributing the contact pressure between the leg and the front upper edge of the upper over a front upper zone of said upper, wherein said distribution means comprises a pressure distribution plate which is journaled about at least one additional axis located on said front cuff at said front upper zone.

4,561,197

GOLF SHOE SOLE STRUCTURES FOR RELIEVING SPIKE-PRODUCED PRESSURE POINTS

Kenneth W. Misevich, Fairfield, Conn., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 525,027, Aug. 22, 1983, abandoned. This application May 3, 1985, Ser. No. 730,040
Int. Cl.[4] A43B 5/00
U.S. Cl. 36—127 **16 Claims**



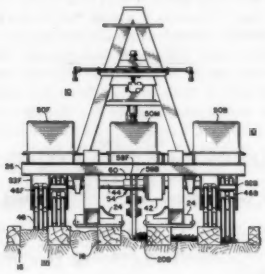
1. A golf shoe comprising a deformable flexible outsole having a ground engaging lower surface and an upper surface, an intermediate compressible sole structure overlying and attached to said upper surface of said outsole, spaced apart capsule portions formed in said outsole and projecting upwardly from said upper surface of said outsole, a set of spaced apart spike receptacles embedded in said outsole and encapsulated in said capsule portions, and ground engaging spikes fastened in said receptacles, said sole structure having a plurality of voids lying vertically above said capsule portions of said outsole, said capsule portions projecting upwardly into said voids from said upper surface of said outsole and moving at least partially into said voids from a normal position when the spikes encounter a hard surface to relieve the pressure points which are exerted on the wearer's foot and thereafter resuming said normal position.

4,561,198

METHOD AND APPARATUS FOR SCARIFYING A RAILROAD CRIB

John D. Holley, Montgomery, Ala., assignor to Holley Engineering Company, Inc., Montgomery, Ala.

Filed Oct. 29, 1984, Ser. No. 666,059
Int. Cl.[4] E02F 5/22
U.S. Cl. 37—104 **30 Claims**



1. An invention comprising a railroad crib scarifying device including a mounting piece and hammer means including at least a first hammer arm movably attached to said mounting piece and operable to extend out a variable distance from said mounting piece, said first hammer arm having a first hammer portion and a first tie protecting portion, and wherein said hammer means functions to loosen up ballast in a railroad track bed with first hammer arm automatically changing between:

I. a cribbing state with said first hammer portion extending downwardly between two adjacent railroad ties such that said first hammer portion is operative to strike and loosen up ballast between the two adjacent railroad ties; and

II. a tie protecting state resulting from said first tie protecting portion contacting a railroad tie and preventing said first hammer portion from damaging the contacted railroad tie.

4,561,199

COMBINATION SPACER AND LIFTING DEVICE FOR MACHINERY INCORPORATING A BUCKET

Michael W. Lockwood, 623½ E. Haley St., Santa Barbara, Calif. 93103

Continuation-in-part of Ser. No. 454,661, Dec. 30, 1982, Pat. No. 4,495,717. This application Nov. 13, 1984, Ser. No. 671,171
The portion of the term of this patent subsequent to Jan. 29, 2002, has been disclaimed.
Int. Cl.[4] E02F 3/76
U.S. Cl. 37—117.5 **12 Claims**

6. In combination

(a) an arm supported lifting bucket having two laterally spaced protruding plates which extend in vertical planes, said bucket having an outer surface which is convexly curved downwardly, and from a location between said plates,

(b) a tubular sleeve extending laterally and having a lateral axis and confined endwise between said plates, and a pin extending laterally through the sleeve and carried by the plates, so that the sleeve may rotate about the pin,

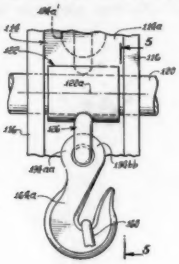
(c) a tab integral with the sleeve and extending downwardly therefrom, outwardly of said bucket surface,

(d) a hook having a stem pivotally attached to said tab to

hang downwardly outwardly of but close to the bucket surface between said plates,

(e) a chain having a link engaging and carried by said hook, the chain extending downwardly to freely and variably engage said bucket curved surface as the bucket is lifted and lowered by said arm supporting the bucket,

(f) the stem having two upwardly projecting yoke arms



forming a space therebetween, the tab projecting downwardly in a plane which is substantially normal to said lateral axis to extend between the yoke arms for pivotal connection therewith and about an axis which extends generally laterally and generally parallel to the bucket surface,

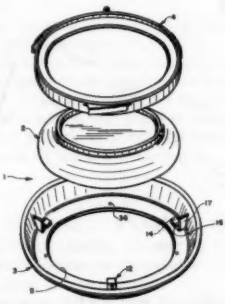
(g) the hook having a side face which at times extends generally flatly proximate the bucket surface.

4,561,200

DISPLAY DEVICE

Bruce A. Hehn, North Canton, Ohio, assignor to Alpha Enterprises, Inc., Canton, Ohio

Filed Dec. 8, 1983, Ser. No. 559,327
Int. Cl.⁴ G09F *1/12*
U.S. Cl. 40—156 **15 Claims**



1. A device for displaying an object such as a plate, picture, mirror or the like, including:

(a) a frame having an opening for visually displaying an object therein;

(b) a plurality of fixed lugs formed integrally on an inner surface of the frame and spaced about the opening; and

(c) retainer means engageable with the fixed lugs for clamping an object to be displayed through the frame opening against the inner surface of the frame in alignment with said frame opening, said retainer means including an annular ring formed with a plurality of integral ramps spaced about the periphery of said ring, with said ramps being slidably engageable with the frame lugs as the ring is rotated with respect to the frame to move the ring axially toward the frame for clamping an object between said frame and ring.

4,561,201

METHOD AND APPARATUS FOR SKY TYPING

George A. Sanborn, 19210 NE. Clackamas St., Portland, Oreg. 97230

Filed Aug. 3, 1984, Ser. No. 637,508
Int. Cl.⁴ G09F *21/16*
U.S. Cl. 40—213 **7 Claims**

1. Sky typing apparatus for attachment to an airplane, comprising:

(a) an elongated support line arranged to be suspended from an airplane when in flight,

(b) a plurality of fog dispensing nozzles each having an infeed end and secured in spaced apart relation along said support line,

(c) electric solenoid valve means associated with each dispensing nozzle for opening and closing the nozzle,

(d) container-confined fog producing material under pressure connected to the infeed end of each nozzle, and

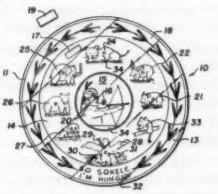
(e) control means connected to said valve means for selectively controlling the opening and closing of the dispensing nozzles in a predetermined sequence, the control means including a computer in the airplane capable of being programmed to provide electric output signals to control activation of the electric solenoid valve means according to airplane speed to produce a predetermined printing in the sky.

4,561,202

PICTURE SCENE APPARATUS

William R. Farmer, 215 Campbell St., New Westminster B.C., Canada (V3M-5K8)

Filed Jul. 11, 1983, Ser. No. 512,586
Int. Cl.⁴ G09F *11/04*
U.S. Cl. 40—495 **6 Claims**



1. An ornament comprising:

a frame;

a central fixed disc attached to the frame;

a picture on the central fixed disc;

an annulus surround the central fixed disc and rotatably located in the frame;

a first magnet located in the annulus;

weighted figures mounted on the rotatable annulus, the figures bearing a relationship to the picture on the central fixed disc;

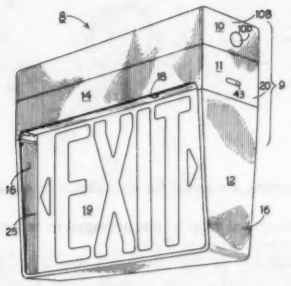
magnetic means to rotate the annulus by magnetic effect on

the first magnet whereby the weighted figures rise and fall as the annulus rotates to change the displayed scene.

4,561,203
OPAQUE SIGN PLAQUE WITH DUAL REFLECTOR ILLUMINATION

Robert D. MacDonald, Jr., Carmel, N.Y.; William A. Luca, Cheshire, and Robert M. Johnstone, Shelton, both of Conn., assignors to Dual-Lite Manufacturing, Naguabo, P.R.

Filed Aug. 4, 1983, Ser. No. 520,334
Int. Cl.⁴ G09F *13/04*
U.S. Cl. 40—570 **10 Claims**



1. An illuminated sign comprising

A. a single central upstanding flat sign plaque with display indicia on at least one exposed display face,

B. a sign plaque-supporting housing assembly having

(1) a bottom wall underlying and supporting the sign plaque,

(2) upstanding sidewall means adjacent to the sign plaque joined to the bottom wall, forming a U-shaped plaque-embracing sub-frame,

(3) a bulb enclosure overlying both faces of the sign plaque to which the sidewall means of the sub-frame are resiliently detachably latched, said sub-frame and bulb enclosure having outer exposed faces positioned in flush relationship forming a plaque-framing housing assembly,

(4) lamp bulb means above the sign plaque embraced within the bulb enclosure, positioned to directly illuminate the indicia on the exposed display face of the sign plaque,

(5) synclastic compoundly concavely curved reflector means overlying the lamp bulb means,

(6) a substantially flat lower reflector underlying the sign plaque, and

(7) both said reflector means supplementing the direct illumination with reflected illumination directed toward the exposed display face of the sign, and

C. with the sidewall means defining, with the bottom wall and the overlying bulb enclosure, display aperture means through which the sign plaque framed within the housing assembly is presented for view and through which direct and reflected illumination is also delivered downward from the lamp bulb means to the surrounding and underlying area beneath the illuminated sign.

4,561,204
RETICLE DISPLAY FOR SMALL ARMS

W. Sidney Binion, P.O. Box 770010, Ste. 15, Houston, Tex. 77215

Filed Jul. 6, 1983, Ser. No. 511,096
Int. Cl.⁴ F41G *1/38*
U.S. Cl. 42—1 ST **8 Claims**

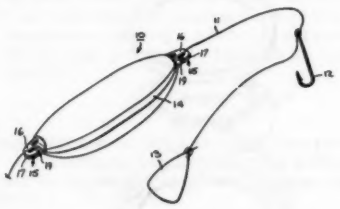
1. A gun sight for small arms having a gun barrel, and for aiming a gun at a target located in a target field, comprising, a telescopic sight for mounting on a gun in axial alignment with the gun barrel and in position to be aligned with a first eye of a user when aiming the gun to observe the target field therethrough, an essentially opaque reticle display means comprising a display screen, a microprocessor, means for generating inputs to said microprocessor including target range and atmospheric conditions affecting projectile ballistic trajectory,

means for displaying an aiming reticle on said screen, the position of said aiming reticle on said screen being controlled by said microprocessor in accordance with said inputs, and means for mounting said display screen in offset relation to the sighting axis of said telescopic sight and substantially in alignment with the other eye of a user when sighting through said telescopic sight with said first eye, whereby the users field of vision combines and superposes and target field and the aiming reticle displayed on said screen.

4,561,205
FLOAT AND DEPTH GAUGE

Theodore P. Kessler, 122 Bridge St., Rancocas, N.J. 08073

Continuation of Ser. No. 474,176, Mar. 10, 1983, abandoned. This application Aug. 17, 1984, Ser. No. 641,929
Int. Cl.⁴ A01K *93/00*
U.S. Cl. 43—4.5 **11 Claims**



1. A float for use with a fishing line comprising

a flotation member of lightweight material having a hollow elongated cylindrical shape with a smooth uninterrupted unencumbered outer surface; and

receiving means mounted on opposite ends of said member to define an aperture for slidably receiving a fishing line therein in enclosed relation, said aperture being of a size to prevent passage of a knot placed in the fishing line whereby the depth at which a hook on the fishing line is to be located for fishing can be established;

said member having an aerodynamic shape and said receiving means being disposed whereby said shape, lightweight and friction forces between a fishing line extending between said means and substantially along the entire length of said outer surface of said member constitute means suffficient to clamp aaid member to the line with tension in the line during retrieving.

4,561,206

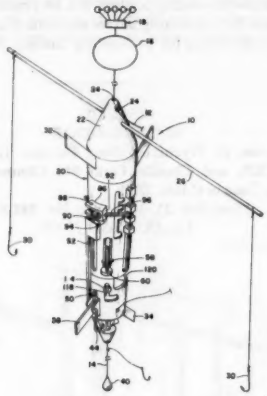
FISHING CAPSULE

Arlen J. Lowrance, and Constance A. Lowrance, both of 142 E. 26th Ct., Tulsa, Okla. 74114

Filed Oct. 22, 1984, Ser. No. 663,567

Int. Cl.[4] A01K *91/00*

U.S. Cl. 43—43.11 **11 Claims**



1. A fishing capsule, comprising:

a housing,

a hinge and an arm spaced apart on a side of the housing,

a portion of line wrappable around the hinge and the arm, means for holding the hinge in a set position,

a guide member movable within the housing and attached to the means for holding the hinge,

a compression spring within the housing adaptable to apply compressive force against the guide member,

a first release member on the housing adaptable to cooperate with the guide member to hold the guide member in a set position, and

a second release member on the housing adaptable to hold a portion of line in a set position,

so that actuation of the first release member allows the guide member to respond to the compressive force of the spring and cause the means for holding the hinge in a set position to move out of cooperable position with the hinge, the second release member to be released from its set position, and the portion of line to be released.

4,561,207

PIN RELEASE FOR ANIMAL TRAP

Milan Novak, Aurora, Canada, assignor to Her Majesty the Queen in Right of Canada, as represented by the Minister of Natural Resources, Toronto, Canada

Filed May 2, 1984, Ser. No. 606,211

Claims priority, application United Kingdom, May 6, 1983, 8312477

Int. Cl.[4] A01M *23/24*

U.S. Cl. 43—87 **7 Claims**

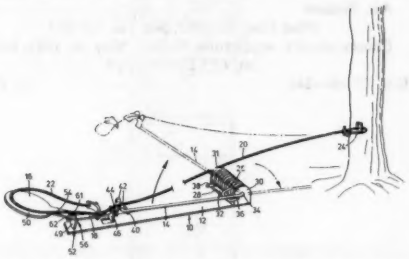
1. A mechanism for retaining and releasing the end of a swing-arm of an animal trap, the trap having a frame to which the swing-arm is pivotally mounted, the mechanism comprising:

a trip-pan having a portion engaging the frame, extending generally perpendicular therefrom, and adapted to pivot about the location of its engagement with the frame,

an elongated pin engaging the said portion at a location spaced from the frame,

support means extending from the frame and having aperture means through which one end of the pin extends,

part of said one end engaging the swing-arm when the said portion of the trip-pan is swung toward the swing-arm, but disengaging from the swing-arm when the said portion is swung away from the swing-arm, the pin having a reduced-diameter groove adjacent its other end, the trip-pan including a substantially flat part, with respect to which the said portion extends substantially perpendicularly, the said part and portion being connected at a knee region, a pin slot in said knee region, the slot including in said substantially flat part an enlarged portion big enough to receive the said other end of the pin, the slot including in said portion a narrower portion big enough to be engaged by said reduced-diameter groove, but too samll to receive the part of the pin beside the groove, said portion



of the trip-pan having a tongue extending therefrom at an obtuse angle and defining a wider portion at either side of the angle and defining a wider portion at either side of the tongue, the frame having a tongue slot through which the tongue engages, the tongue slot being sufficiently narrow to prevent removal of the tongue after the tongue has been inserted with the tongue perpendicular to the frame, and then rotated to bring the said portion of the trip-pan perpendicular to the frame, the said other end of the pin engaging under the said portion of the trip-pan, to prevent the trip-pan from being rotated to a position at which the tongue can be withdrawn from the tongue slot.

4,561,208

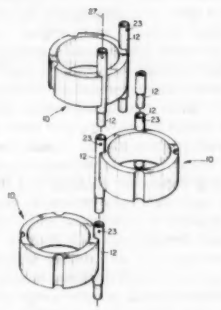
MODULAR PLANTER SYSTEM

John R. Schultz, 1046 S. Park Acres, Batesville, Ind. 47006

Filed Dec. 6, 1982, Ser. No. 447,407

Int. Cl.[4] A01G *9/02*

U.S. Cl. 47—83 **4 Claims**



1. A modular planter system, comprising:

a plurality of pot housings, each of said pot housings having an open bottom and each of said pot housings defining a plurality of circumferentially spaced-apart mounting locations; and

a plurality of vertically disposed connecting members interconnecting said pot housings along a plurality of spaced-

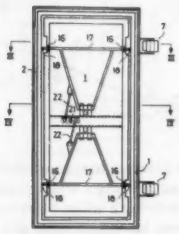
apart vertical axes, at least two of said plurality of pot housings vertically spaced-apart by said connecting members, each of said circumferentially spaced-apart mounting locations defining a vertical channel sized to receive therein a corresponding one of said connecting members, said connecting members providing interconnection of said pot housings in any radial orientation about said vertical axes.

4,561,209

DOOR IN A CONSTRUCTION PREVENTING THE TRANSITION OF INTERFERENCE FIELDS

Lasse Sohlström, Eura, Finland, assignor to Oy Euramechano AB, Finland

Filed May 24, 1983, Ser. No. 497,727
Claims priority, application Finland, May 28, 1982, 821904
Int. Cl.⁴ E05D *15/28*
U.S. Cl. 49—246 **11 Claims**



1. In a door assembly in a construction for substantially preventing the transition of interference fields, in particular of high-frequency electromagnetic fields, into a space, the door assembly including a door pivotally mounted to a stationary structure by hinge means, and wherein said door and stationary structure are provided with co-operating means for producing an interference field transition-preventing contact when said door is in a closed position with respect to said stationary structure, the improvement comprising:

said hinge means providing a pivoting movement of said door to a position wherein said door is substantially linearly displaced with respect to said stationary structure; and

means provided on said door and stationary structure for moving said door in a substantially linear movement path to said closed position with respect to said stationary structure, whereby said contact means produces an interference field transition-preventing contact, and said means also preventing lateral movement of said door during the substantailly linear closing movement thereof;

wherein said means for moving said door in a substantially linear movement path to said closed position to produce the interference field transition-preventing contact include locking means for locking said door in its closed position to said stationary structure, said locking means including guide means provided on said door and stationary structure for guiding said door in the substantially linear movement path, and further including

means for operating said locking means, said operating means including lever members operatively associated with said locking means and a handle coupled to said door and operatively associated with said lever members;

wherein said hinge means include a first pivot shaft mounted on said stationary structure defining a pivot axis with respect to which said door moves in said pivoting movement, and a second shaft mounted or said door and extending substantially parallel to said first shaft, said first and second shafts being interconnected by means for permitting said door to move in said linear movement path; further including

means provided on said hinge means for limiting the extent of pivoting movement of said door;

wherein said pivoting movement limiting means include a spring-loaded stop member mounted on said hinge means;

wherein said stop member is mounted on said hinge means for adjustable positioning;

wherein said means for producing the interference field transition-preventing contact is a labyrinth seal; and

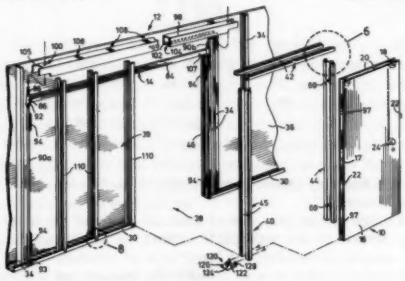
said means for preventing lateral movement of said door also constitute means for preventing damage to the labyrinth seal.

4,561,210

SLIDING DOOR

Peter J. Kvas, 81 Wychcrest Ave., Toronto, Ontario, Canada (M6G 3X8), and Claudio Fera, 444 Clinton St., Toronto, Ontario, Canada (M6G 2Z2)

Filed Feb. 21, 1984, Ser. No. 581,820
Int. Cl.⁴ E05D *15/06*
U.S. Cl. 49—372 **15 Claims**



1. A sliding door assembly for use in a wall construction having a pair of spaced panels forming a wall cavity, comprising:

a hanger assembly having a pair of spaced vertical posts and a horizontal rail supported at each end thereof by the posts; and

a door having the upper portion thereof carrying roller means engaging the rail, whereby the door is slidably hung on the rail for movement in the wall cavity, the door comprising a pair of spaced parallel panels and the roller means comprising a pair of spaced rollers journally mounted between the panels.

4,561,211

VEHICLE DOOR AND WINDOW ASSEMBLY

Ronald J. Raley, Oxford, and James R. Warren, Lincoln Park, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 5, 1983, Ser. No. 520,529
Int. Cl.⁴ E05F *11/38*
U.S. Cl. 49—374 **3 Claims**

1. In an automotive vehicle having a framed door structure defining an opening above its belt line for receiving a curved window pane which is movable between an upper closed position in which it covers said opening and a lower open position in which it uncovers said opening and is received within said door below the belt line thereof,

said door having generally vertically extending fixed guide means located adjacent said window pane along its leading and trailing edges,

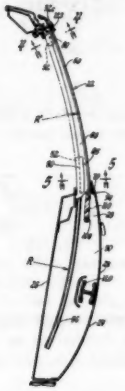
movable guides secured to said window pane adjacent and along its leading and trailing edges and slidably connected with said fixed guide means for upward and downward movement relative thereto,

said fixed guide means guiding the movement of said mov-

able guide means through an arcuate path having a given radius when said window is moved between its open and closed positions;

seal means carried by said door along its belt line for engaging said window pane on its exterior side when said window pane is in its closed position,

the movement being that said movable guides have a transverse dimension as measured from the window pane to their path of movement which progressively increases proceeding from their upper edges toward their lower



edges so that the window pane is spaced further from the fixed guide means at its lower end portion than at its upper end portion so that said window pane has a radius which is greater than said given radius,

said movable guides causing the window pane to move away from said belt line seal means as it is moved toward its open position and causing said window pane as it is moved toward its closed position to also move progressively outwardly of said door to engage said seal means and be substantially flush with the door at its exterior belt line thereof.

4,561,212

INSERT FOR LAMINATED DOORS

Myron E. Ullman, Jr., Canfield, Ohio, assignor to Kessler Products Co., Inc., Youngstown, Ohio

Filed Sep. 30, 1982, Ser. No. 428,909
Int. Cl.⁴ E06B *3/00*
U.S. Cl. 49—503 **20 Claims**

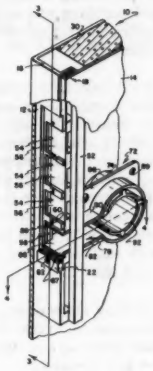
1. A plural part sealing insert assembly for use in the manufacture of laminated doors of the type that include a pair of spaced laminations that define opposed faces of the door and that define a space there between that is to be filled with a flowable filler material that hardens in situ, the sealing insert assembly serving to define lock-mounting openings and to prevent the filler from entering said openings during door manufacture, comprising:

(a) a door edge plate having a width equal to the spacing between the door laminations and having an opening means in the door edge plate for the passage of a lock bolt through the door edge;

(b) a receptacle for a lock cylinder, said receptacle having a length equal to the spacing between the door laminations and being open at each end for the reception of a lock cylinder, and the receptacle also having a lateral opening for access of the bolt lock mechanism;

(c) a lock bolt housing means providing an access connection between the lateral opening in the receptacle and the opening in the door edge plate;

(d) connection means integral with the parts of the insert assembly providing for direct manual connection of the parts of the insert assembly to form a complete insert assembly in the absence of independent fastening elements; and,



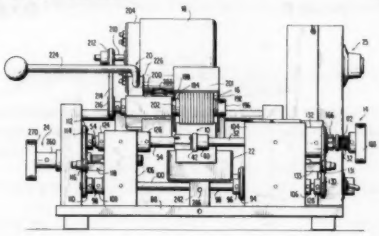
(e) the insert assembly having formation means for engaging the door laminations to prevent entry into the opening means and the open ends of the receptacle of filler when a flowable filler is being delivered into the space between the door laminations to substantially fill said space.

4,561,213

APPARATUS FOR POLISHING THE EDGES OF LENSES

Joseph Tusinski; Brian R. Barnes, and Herbert H. Mathews, all of Muskogee, Okla., assignors to Coburn Optical Industries, Inc., Muskogee, Okla.

Filed Apr. 22, 1982, Ser. No. 370,860
Int. Cl.⁴ B24B *5/00*
U.S. Cl. 51—105 LG **5 Claims**



1. Apparatus for polishing the edges of lenses, said apparatus comprising:

a lens holder comprising two lens gripping jaws which, in use grip a lens for rotation about a first axis which is generally perpendicular to the lens;

first means for rotating said lens holder;

second means for translating one of said gripping jaws axially in order to release or grip a lens between said gripping jaws;

a polishing pad mounted for rotation about a second axis parallel to but spaced from said first axis,

said polishing pad is cylindrical in shape and symmetrical about said second axis;

third means for rotating said polishing pad about said second axis;

fourth means for translating said polishing pad in a plane perpendicular to said second axis to bring it into and out of engagement with a lens as gripped by said lens holder;

fifth means for translating said polishing pad axially to bring different portions of said polishing pad into engagement with lenses gripped by said lens holder, said fifth means including,

means for operably permitting a degree of free, random, axial travel of said polishing pad along said second axis during a second axis polishing operation;

said second means comprising;

a bearing block,

a sleeve which is journalled for rotation in said bearing block and which is rotated by said first means, said sleeve having a threaded through bore therein; sixth means for preventing axial movement of said sleeve.

a shaft on which said one of said gripping jaws is mounted, said shaft having external threads which are received in the threads in said through bore in said sleeve, and

seventh means for rotating said shaft relative to said sleeve including a clutch which, when engaged, causes said shaft to turn with said sleeve and which, when disengaged permits said shaft to turn relative to said sleeve; and

a container for polishing abrasive spaced in proximity to said lens holder in position so that, in use, a lens gripped by said lens holder picks up a coating of polishing abrasive on its edges as it is rotated.

4,561,214

ABRADING TOOL

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Kanagawa, Japan

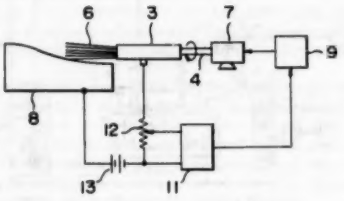
Continuation of Ser. No. 26,775, Apr. 3, 1979, abandoned. This application Mar. 5, 1982, Ser. No. 355,301

Claims priority, application Japan, Oct. 12, 1978, 53-125451; Oct. 18, 1978, 53-128847; Oct. 21, 1978, 53-130195; Nov. 8, 1978, 53-136762; Nov. 17, 1978, 53-142558; Nov. 17, 1978, 53-142559; Nov. 21, 1978, 53-144747; Nov. 22, 1978, 53-144703; Nov. 22, 1978, 53-144704; Dec. 2, 1978, 53-149826; Dec. 27, 1978, 53-160114; Mar. 24, 1979, 54-34847

The portion of the term of this patent subsequent to Jan. 4, 2000, has been disclaimed.

Int. Cl.⁴ B24B *49/16*

U.S. Cl. 51—165 R **15 Claims**



1. A machine comprising:

a tool for treating a workpiece comprising a a rotary shank and a plurality of elongated pieces fixed at corresponding ends to said shank so as to individually project axially therefrom and extending so as to collectively form, when the shank is not in rotation, a forwardly converging inactive body of revolution substantially centered on the rotary axis of said shank, said pieces being stiff and resilient and having workpiece-treating surfaces along a length thereof; and

a motor connected to said shank for rotating said tool at a speed sufficient with respect to the stiffness of said pieces such that the pieces collectively form an active body of revolution centered on the rotary axis of said shank and with free ends of said pieces spread away from one another and from their positions in said inactive body solely by the centrifugal force of said rotation, said active body of revolution having a generatrix, said surfaces of said pieces along said generatrix of said active body of revolution when said motor rotates said shank serving as an abrading or burnishing means slapping at a workpiece when said tool is engaged laterally by a workpiece.

4,561,215

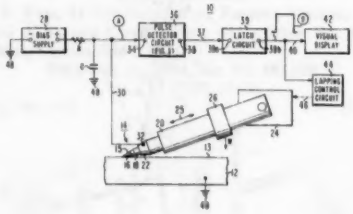
STYLUS LAPPING CONTROL

Elvin D. Simshauser, Columbus, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 26, 1984, Ser. No. 593,092

Int. Cl.⁴ B24B *9/16*

U.S. Cl. 51—165.75 **4 Claims**



1. Apparatus for controlling the lapping of a stylus having a conical diamond tip bonded to an electrically conductive shank, said shank formed of a rapid oxidizing metal comprising:

(a) means for removably supporting said stylus positioned with said tip in contact with the surface of a rotating electrically conductive scaife having abrasive diamond particles embedded in the surface of the scaife;

(b) means for providing a DC bias to establish an electric field between said shank and said scaife;

(c) means for detecting an electrical signal and providing a control signal responsive thereto when said diamond tip is sufficiently lapped in the vicinity of said shank to lower the conductive shank close enough to the scaife to break down said electric field or make electrical contact between said shank and scaife;

(d) means responsive to said control signal for removing said tip from contact with said scaife to thereby cease lapping the stylus; and

(e) means to provide a preselected force of said stylus tip on said surface having a value lying in the range of 2 to 30 grams and wherein said DC bias has a value lying in the range of 5 to 100 volts, the respective values of said force and DC bias being selected to break down the insulation of oxide that exists on said shank to thereby detect said electrical signal.

4,561,216

WORKPIECE ENGAGING APPARATUS IN GRINDING MACHINES

Satoshi Miyatake, Kawagoe; Mitsuo Abe, Kiyose; Masao Kume, Tokyo; Shigehiro Yonemura, and Hiroshi Umino, both of Sayama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 8, 1984, Ser. No. 638,689

Claims priority, application Japan, Aug. 9, 1983, 58-146021

Int. Cl.⁴ B24B *49/16*

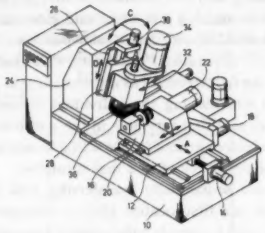
U.S. Cl. 51—165.92 **8 Claims**

1. A workpiece engaging apparatus comprising:

(a) a tool drive source for driving a rotary tool;

(b) a workpiece drive source for driving a workpiece through a clutch mechanism, the workpiece being in operative engagement with the rotary tool;

(c) a detector circuit for detecting an increase in a load in said tool drive source; and



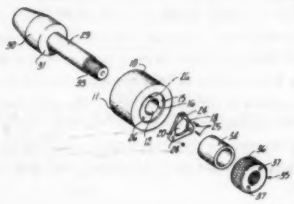
(d) a circuit for actuating said clutch mechanism with a time delay after a predetermined load increase detectd by said detector.

4,561,217

SYSTEM FOR PRECISION CENTERING A BORE UPON A SHAFT

Rex F. Steyskal, Roseville, Mich., assignor to Sidley Diamond Tool Company, Garden City, Mich.

Filed Jun. 14, 1984, Ser. No. 620,633
Int. Cl.[4] B24B *41/04*
U.S. Cl. 51—168 **9 Claims**



1. A system for precision centering the bore of a rotary member upon a mounting shaft, comprising:

a precision circular circumference mounting shaft having a free end and a radially outwardly extending shoulder on the shaft at a predetermined distance from the free end;

a rotary member having a bore extended therethrough for relatively loosely receiving the shaft, and having a stop face at one end for engaging the shaft shoulder; the opposite face of the rotary member being provided with a circular, depressed socket defined by a cylindrically shaped socket wall that is coaxial with the bore;

a generally triangular shaped, flat, plate-like insert positioned within the socket with its corner portion engaging the socket wall, and with the insert being slightly oversize relative to the socket wall periphery so that it is under a radially inwardly compressive force from the socket wall;

a central opening formed in the insert and overlying the bore, in coaxial alignment therewith;

said opening being defined by endwise separated, arcuate segments, whose radii are centered on the bore center and are slightly shorter than the shaft radius, which in turn is slightly shorter than the bore radius;

means holding the rotary member stop face against the shaft shoulder;

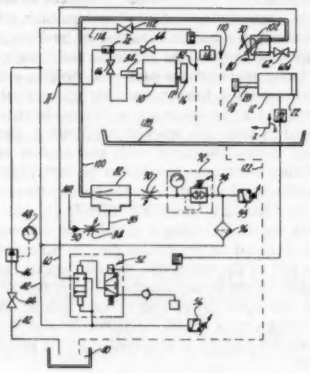
whereby the insert arcuate segments are in substantially linear engagement with, and resiliently compress inwardly against, the peripheral surface of the shaft for precisely centering the bore upon the shaft.

4,561,218

CLOSE TOLERANCE INTERNAL GRINDING USING COOLANT MIST

Victor F. Dzewaltowski, Springfield, and Steven P. Farmer, North Springfield, both of Vt., assignors to Ex-Cell-O Corporation, Troy, Mich.

Filed Feb. 8, 1985, Ser. No. 699,707
Int. Cl.[4] B24B *1/00*
U.S. Cl. 51—290 **7 Claims**



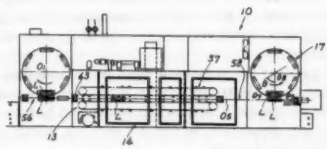
1. In grinding an internal cylindrical bore having an interruption in the bore wall which adversely affects the bore roundness tolerance achievable by said grinding, the steps for improving bore roundness comprising radially feeding a rotating grinding wheel relative to the bore longitudinal axis and bore wall, respectively, in a rough grind stage with a high radial feed rate and with a stream of liquid coolant discharging on the grinding wheel and in a subsequent finish grind stage with the radial feed rate reduced and with the liquid coolant stream discontinued and a mist of liquid coolant droplets suspended in a gaseous stream discharging on the grinding wheel.

4,561,219

PROCESS AND APPARATUS FOR FINISHING ELECTRONIC DEVICE

Shoichi Harada, Susono, and Matsuo Ohtake, Numazu, both of Japan, assignors to Fuji Seiki Machine Works Ltd., Shizuoka, Japan

Filed May 6, 1983, Ser. No. 492,298
Claims priority, application Japan, Dec. 23, 1982, 57-224981
Int. Cl.[4] B24C *1/00, 3/08*
U.S. Cl. 51—319 **13 Claims**



3. A machine for finishing electronic devices, such as lead frames for integrated circuit chips, comprising:

supply means for said electronic devices including a first substantially horizontal turntable rotatable about a first substantially vertical axis, and a plurality of first cassettes mounted on said first turntable adjacent the periphery thereof, said first cassettes being disposed in substantially uniformly angularly spaced relationship on said first turntable relative to said first axis, each of said first cassettes

defining a vertically oriented chamber adapted to support therein a plurality of electronic devices disposed in vertically stacked relationship;

removal apparatus for permitting removal of finished electronic devices, said removal apparatus including a second substantially horizontal turntable rotatable about a second substantially vertical axis, said second turntable being disposed a selected distance from said first turntable, and a plurality of cassette units mounted on said second turntable adjacent the outer periphery thereof in substantially equally angularly spaced relationship, each said cassette unit including a holder mounted on and projecting upwardly from said second turntable and a second cassette detachably mounted on each said holder, each of said second cassettes having an interior vertical chamber adapted to accommodate a plurality of electronic devices disposed in vertically stacked relationship, and one-way holding means associated with said second cassette for permitting electronic devices to be individually moved into said second cassette from the bottom thereof and then stacked vertically upwardly therefrom, said one-way holding means including a plurality of one-way holding pawls mounted on the holder directly adjacent the open lower end of the respective second cassette, and removable support pin means adapted to be removably inserted across the open lower end of said second cassette for supporting a stack of said electronic devices therein when said second cassette is removed from its respective said holder;

horizontally elongated transfer means extending from a first location disposed tangentially adjacent said first turntable to a second location disposed tangentially adjacent said second turntable for permitting individual electronic devices to be moved from said first turntable to said second turntable;

means associated with said transfer means at a third location disposed intermediate said first and second locations for subjecting said electronic devices to a blasting media;

a first transfer mechanism associated with said first location for individually and sequentially removing electronic devices from the first cassette as disposed adjacent said first location and transferring said electronic devices individually and sequentially onto the upstream end of said transfer means; and

a second transfer mechanism associated with said second location for individually and sequentially removing the electronic devices from the downstream end of said transfer means and moving then into the second cassette as disposed adjacent said second location, said second transfer mechanism including first means for engaging a said electronic device at said second location and displacing said electronic device sidewardly from said transfer means along a direction which projects radially inwardly relative to said second turntable until said device is aligned below said second cassette, and second means for engaging and lifting said electronic device upwardly into said second cassette.

10. A process for removing resin burrs and flash from the lead frame of an electronic device, such as an integrated circuit chip, said electronic device when positioned horizontally having a length dimension which exceeds its width dimension, comprising the steps of:

providing a first horizontal turntable rotatable about a substantially vertical axis and having a plurality of first cassettes mounted thereon adjacent to periphery thereof in angularly spaced relationship therearound, each cassette defining therein a vertically oriented chamber having a horizontal cross-section which approximately corresponds to that of the electronic device and which is oriented such that the narrow width dimension of the chamber projects substantially in the radial direction of the turntable;

positioning a plurality of unfinished electronic devices in vertically stacked relationship within at least some of the angularly adjacent first cassettes;

rotatably indexing said first turntable so that one of said first cassettes, as containing a stack of said electronic devices therein, is moved into a first angular position;

individually and sequentially dispensing said electronic devices from the first cassettes as disposed at said first angular position and moving the individual devices radially outwardly of said first turntable in the widthwise dimension of the electronic device into a first location disposed adjacent the periphery of said first turntable;

individually and sequentially transferring said electronic devices from said first location along a substantially horizontal path which extends substantially tangentially with respect to said first turntable to a second location disposed adjacent an inlet to a blasting chamber;

moving the electronic devices individually and sequentially through the blasting chamber along said horizontal path from the second location to a third location disposed adjacent the outlet end of the blasting chamber;

supporting the electronic devices solely along the opposite side egdes thereof while maintaining the device substantially horizontal so that the upper and lower surfaces thereof are exposed while subjecting the electronic devices to streams of wet-blasting media as the devices move through said blasting chamber to effect removal of the resin flash and burr from the devices;

providing a second horizontal turntable which is horizontally spaced a substantial distance from said first turntable and is also rotatable about a substantially horizontal axis;

moving said electronic devices individually and sequentially from said third location along a path which extends substantially tangentially of said second turntable to a fourth location which is diposed adjacent the periphery of said second turnatable, the electronic devices being oriented with the lengthwise dimension thereof along the path of movement as they are moved between said first and fourth locations;

providing a plurality of second cassettes removably mounted on said second turntable adjacent the periphery thereof in angularly spaced relationship therearound, each of said second cassettes defining therein a vertical chamber adapted to accommodate a vertical stack of said electronic devices;

rotatably indexing said second table into a second angular position wherein an empty one of said second cassettes is disposed adjacent said fourth location on a radial line which extends substantially perpendicular to the path of movement between said third and fourth locations;

individually and sequentially displacing the electronic devices from said fourth location radially inwardly of said second table along the widthwise dimension of the electronic device until the displaced electronic device is vertically aligned with the empty second cassette disposed at said second angular position, and then vertically displacing the elecronic device into the interior of the second cassette;

repeating the last mentioned steps until the second cassette as located at said second angular position is filled with electronic devices;

then angularly indexing the second turntable until the next adjacent empty second cassette is moved into said second angular position with the filled second cassette being moved angularly away from said second angular position;

thereafter removing the filled second cassette from said second turntable.

4,561,220

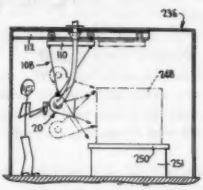
PORTABLE ABRASIVE THROWING WHEEL DEVICE

James H. Carpenter; Ronald L. Mullins, and Ronald L. Smith, all of Hagerstown, Md., assignors to Kennecott Corporation, New York, N.Y.

Continuation of Ser. No. 509,664, Jun. 30, 1983, abandoned, which is a continuation of Ser. No. 223,026, Jan. 6, 1981, abandoned. This application Dec. 13, 1984, Ser. No. 681,512

Int. Cl.[4] B24C *5/04*

U.S. Cl. 51—427 8 Claims



1. An abrasive supply unit for a portable abrasive throwing wheel device, said abrasive supply unit comprising a throwing wheel housing side plate, a fixed abrasive supply spout secured to said side plate and extending therethrough, a radial bearing assembly carried by said side plate and including an outer mounting ring unit, a radial bearing mounted in said outer mounting ring unit, an abrasive supply sleeve carried by said bearing for relative rotation between said abrasive supply sleeve and said spout, said spout having an entrance opening of a greater cross-sectional size than the interior of said abrasive supply sleeve, said abrasive supply sleeve defining an annular compressed air manifold, and air jets opening into said spout around said abrasive supply sleeve for facilitating abrasive flow into said spout.

4,561,221

WINDOWS

Frederick B. McKee, "Orcades" Mill Rd., Burnham-on-Crouch, Essex, England

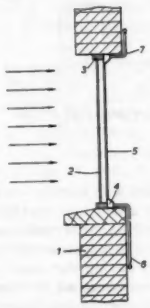
PCT No. PCT/GB82/00273, § 371 Date May 17, 1983, § 102(e) Date May 17, 1983, PCT Pub. No. WO83/01103, PCT Pub. Date Mar. 31, 1983

PCT Filed Sep. 17, 1981, Ser. No. 503,151

Claims priority, application United Kingdom, Sep. 17, 1981, 8128190

Int. Cl.[4] F24J *3/02;* E06B *9/24*

U.S. Cl. 52—171 12 Claims



1. For use in a building, a glazing system including glazing which comprises a front glazing member on which solar radiation is to be incident during use thereof, which glazing member is transparent or translucent, and a rear glazing member opposed to said front glazing member and which is likewise transparent or translucent, which glazing members are comprised by a panel having opposed wall members and header means for throughflow of a liquid as part of duct means comprised by or to be installed with said panel and comprising appropriate components for forming a closed circuit passing externally of the glazing member for passage of a heat exchange liquid and dissipation of absorbed solar radiation at a location external of the glazing members, the colouring of the heat exchange liquid being such that solar radiation incident on the front glazing member is able to pass through the heat exchange liquid whereby its infrared component is at least partially absorbed thereby and light is able to pass therethrough in accordance with the optical densities of the heat exchange liquid and the materials from which the front and rear glazing members are made, and said panel comprising a plurality of separator walls which define between the pair of opposed wall members a plurality of elongate channels extending in side-by-side relationship between the wall members and each connected at their respective ends with said header means.

4,561,222

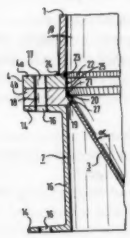
LARGE CONTAINER ESPECIALLY A SILO

Gerrit Fons, Zaandam, Netherlands, assignor to Jansens & Dieperink B.V., Zaandam, Netherlands

Continuation-in-part of Ser. No. 344,939, Feb. 2, 1982, abandoned. This application Apr. 22, 1985, Ser. No. 725,414

Int. Cl.[4] E04H *7/30*

U.S. Cl. 52—197 10 Claims



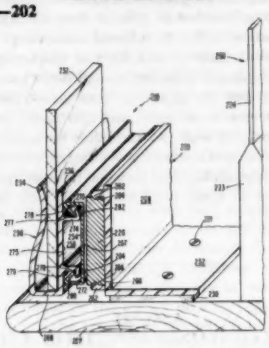
1. A large container, especially a silo, comprising: an essentially cylindrical, unitary material holding main part having a base and a sidewall extending upwardly therefrom; a substantially conically shaped unloading hopper positioned at the base of the main part, said hopper having a downwardly tapered sidewall, and being provided at its lower end with an outlet for discharging material from the container; annular flange means for securing the unloading hopper to the base of the main part, said flange means being solid and having a vertical thickness substantially greater than that of the sidewall of the main part and the hopper, said flange means including an annular substantially cyindrical inner wall secured along its upper margin directly to the base of the main part and along its lower margin directly to the hopper, said flange means further including an annular inwardly extending projection, said projection having an annular, downwardly inclined inner surface which is continuous with said cylindrical inner wall of the flange means for engaging and supporting an annular area of the tapered sidewall of the hopper adjacent to the base of the main part whereby the load bearing strength of the flange means and the hopper are enhanced; and an annular ring member releasably secured at its upper end to said annular flange means, the lower end of said ring member being adapted to engage support means for maintaining said container in a stable upright position during use.

4,561,223

PANEL FASTENER SYSTEM AND RETAINING MEMBER

Stanley Gold, Mahopac; Robert Newman, and Eric Lavigne, both of Hopewell Jct., all of N.Y., assignors to Defender Energy of Connecticut, Inc., Bridgeport, Conn.

Filed Feb. 3, 1983, Ser. No. 463,629
Int. Cl.[4] E06B *3/26*
U.S. Cl. 52—202 **18 Claims**



1. A panel fastener system for securing a panel to a frame across an opening comprising:

a frame member mounted along the length of the frame and having a first magnetic element non-adhesively mounted thereto;

a panel means of suitable size to cover the opening;

a panel retaining member extending along and mounted to the edges of the panel, the retaining member having an outer and an inner leg connected to each other at one end, the edges of the panel being retained and mounted therebetween;

a second magnetic element non-adhesively mounted to the inner leg, the first and second elements being magnetically attachable to each other;

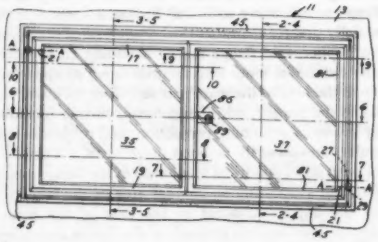
wherein the inner leg and second magnetic element mounted thereto are both shaped and mounted to each other to form a rigidized elongated hollow structural member therebetween along the length of the edges of the panel.

4,561,224

SLIDING WINDOW ASSEMBLY FOR A VEHICLE

David P. Jelens, Kentwood, Mich., assignor to GRM Industries, Inc., Grand Rapids, Mich.

Filed Jan. 16, 1984, Ser. No. 571,324
Int. Cl.[4] E06B *1/04*
U.S. Cl. 52—207 **22 Claims**



1. A sliding window assembly flush mountable within an elongated window opening within the body of a vehicle comprising;

an elongated continuous frame nested within said opening and peripherally sealed and retained within said body;

a stationary window mounted and sealed within one side of said frame;

opposed top and bottom inwardly curved first channel tracks formed within the other side of said frame;

opposed top and bottom inwardly curved second channel tracks formed within said one side of said frame spaced inwardly of said stationary window;

said first and second tracks having longitudinally aligned entrant openings;

a slidable window mounted upon said frame aligned with said stationary window when closed;

opposed longitudinally spaced outwardly directed first and second guide pins upon said slidable window, with said first guide pins extending into said first channel tracks and said second guide pins extending into said second channel tracks;

said pins on retraction of said slidable window moving within said first and second tracks and said slidable window being displaced laterally inward and parallel to said stationary window when opened;

said frame including opposed symmetrical vertically aligned upper and lower frame sections;

said sections at their ends respectively having opposed aligned downwardly and upwardly extending end portions defining a transverse joint line;

there being an irregularly shaped transverse slot in one of said end portions at said joint line and a correspondingly shaped transverse tongue in the adjacent end portion at said joint line, in snug interlocking registry respectively; and

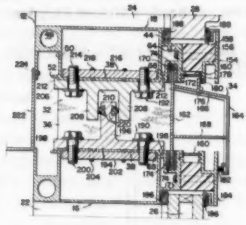
means securing said interlocked aligned end portions together to form a unit frame.

4,561,225

CURTAIN WALL UNITS IN A UNIT TYPE CURTAIN WALL

Karl Gartner, Gundelfingen, Fed. Rep. of Germany, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Aug. 1, 1983, Ser. No. 519,209
Claims priority, application Japan, Aug. 10, 1982, 57-138896
Int. Cl.[4] E04H *1/00*
U.S. Cl. 52—220 **4 Claims**



1. A prefabricated curtain wall unit for combined use with other like units to provide a unit type curtain wall assembly, the curtain wall unit comprising panel means, and a plurality of top, bottom, and side frame members combined into a generally rectangular shape and having the panel means mounted thereto, the frame members being all of identical cross-sectional shape, each frame member having formed longitudinally therethrough a passageway for a heat transfer fluid and a mounting recess in side-by-side relation to each other, with the passageway positioned inwardly of the mounting recess and with the mounting recess being open outwardly for connecting to a further frame member in a further adjacent curtain wall unit, and each frame member having further formed longitudinally therethrough a second passageway for warm or cool air, the second passageway occupying a major portion of the frame

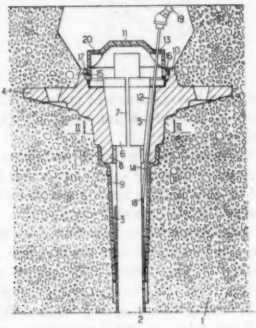
member, and wherein the first recited passageway and the mounting recess are positioned interiorly of the second passageway, and a mounting portion positioned exteriorly of the second passageway for connection of the frame member at least to the panel means.

4,561,226

PROCESSES AND DEVICES FOR GREASING THE ENDS OF PRESTRESS REINFORCEMENTS

Christian Tourneur, Le Pellerin, France, assignor to Freyssinet International (STUP), Boulogne Billancourt, France

Filed Apr. 16, 1984, Ser. No. 600,453
Claims priority, application France, Apr. 19, 1983, 83 06374
Int. Cl.⁴ E04C *5/12, 5/16*
U.S. Cl. 52—223 L **8 Claims**



1. An assembly at the end of a prestressed concrete member for greasing the end of a reinforcement rod comprising:

a greased sheath;

a reinforcement rod disposed in said greased sheath so that a portion of said reinforcement rod extends beyond said sheath;

an anchor plate having a top side and a bottom side, said anchor plate defining a conical shaped central opening with an interior surface extending between and opening at said top and bottom sides, and a groove extending the length of said interior surface, wherein said groove terminates before said sheath;

a set of jaws, disposed in said conical shaped central opening of said anchor plate, gripping said portion of said reinforcement rod; and

a cap fitted over said opening on said top side, said cap having a hole passing therethrough alignable with said groove.

4,561,227

PATIO ENCLOSURE

Barry G. Austin, Marshall, Mich., assignor to General Aluminum Products, Inc., Charlotte, Mich.

Filed Apr. 16, 1984, Ser. No. 601,044
Int. Cl.⁴ E04B *1/12*
U.S. Cl. 52—226 **6 Claims**

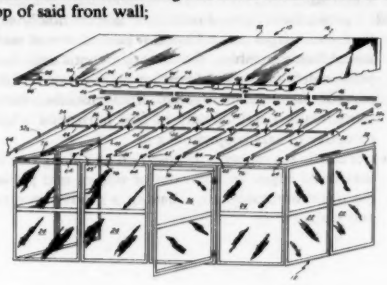
1. A patio enclosure adapted to be secured adjacent an exterior wall of an existing structure, said enclosure comprising:

a plurality of front panels and side panels, said panels being hingedly secured, one to another, and erectable, to form the sidewalls and front wall of said enclosure;

a plurality of rafter assemblies each extending in downwardly sloped fashion from said exterior wall to the top of the front wall, each of said rafter assemblies including upper and lower rafter sections having centrally depending therefrom a cable receiving finger, said finger having at least two vertically displaced cable receiving slots therein, the associated stabilizing cable being movable from one slot to the other to straighten the associated rafter assembly;

first means for connecting said upper rafter section to said exterior wall;

second means for connecting said lower rafter section to the top of said front wall;



a stabilizing cable interconnected between said first and second connecting means and passing through said slot, the length of said stabilizing cable being such that in its secured condition the rafter assembly of which it is a part is generally straight;

a flexible roof overlying said rafter assemblies; and

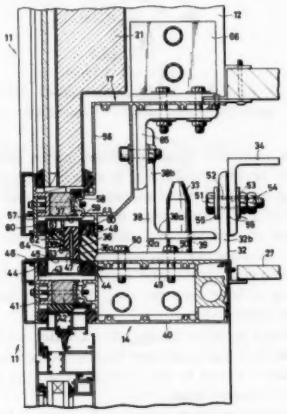
means for securing said roof in said overlying position.

4,561,228

UNIT CURTAIN WALL

Hiromitsu Kaminaga, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed May 18, 1984, Ser. No. 611,898
Claims priority, application Japan, May 20, 1983, 58-74675
Int. Cl.⁴ E04B *2/88*
U.S. Cl. 52—235 **9 Claims**



1. A unit curtain wall comprising:

(a) a plurality of adjacent curtain wall units each having a pair of horizontally spaced vertical edges, said adjacent pair of curtain wall units having respectively a pair of vertically adjacent horizontal frame members each including a pair of interior and exterior parts connected together;

(b) a pair of fasteners adapted to be mounted on a building frame and connected respectively to said vertical edges of

a respective one of said curtain wall units for supporting the latter on said building frame;

(c) an auxiliary support adapted to be mounted on the building frame and connected to a lower one of vertically adjacent horizontal edges of each pair of adjacent curtain wall units;

(d) a projection disposed on one of said vertically adjacent horizontal edges on said interior part of one of said horizontal frame members, the other horizontal edge having a portion defining a pair of positioning edges on said interior part of the other horizontal frame member extending substantially longitudinally of said horizontal edges and receptive of said projection; and

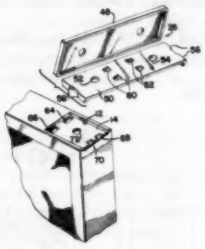
(e) an elastic sealing strip disposed on and along one of said horizontal edges, on the exterior side of said projection, the other horizontal edge having a groove receptive of said sealing strip.

4,561,229

MODULAR SCREEN ASSEMBLY

Clifford W. Gartung, Newport Beach, Calif., assignor to Pleion Corporation, Santa Ana, Calif.

Filed Sep. 30, 1982, Ser. No. 429,042
Int. Cl.[4] E04H *1/00*
U.S. Cl. 52—239 **12 Claims**



1. In an improved modular office screen system having a plurality of hollow rigid frame members, each frame member supporting a central panel member and extending about the periphery of the central panel member to provide horizontal and vertical aligned sections connected together to form corner edges, the improvement comprising:

an upper planar horizontal section of each frame member having at least one aperture limited to an adjacent an upper corner edge;

a connector member having slots configured for mounting within each frame member is attached across the aperture to form a recess in the horizontal section limited to an adjacent corner edge, and

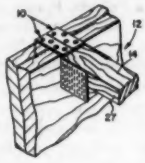
a fastener member configured for mounting within and filling the recess of the aperture to provide and upper contiguous planar surface with the outer horizontal periphery of the horizontal section of the frame member, the fastener member having both securement means for securing the fastener member directly to a connector member in each frame member and indexing tab means positioned on either side of the securement means, on the bottom surface of the fastener member and engages said slots in the connector member, for preventing lateral movement between adjacent frame members.

4,561,230

TRUSS ASSEMBLY AND TRUSS HANGER AND CONNECTOR HANGER FOR USE WITH TRUSSES

Carlos S. Rionda, and Joaquin J. Palacio, both of Miami, Fla., assignors to Gang-Nail Systems, Inc., Miami, Fla.

Filed Sep. 27, 1982, Ser. No. 424,216
Int. Cl.[4] F16B *5/00*
U.S. Cl. 52—289 **3 Claims**



1. A wooden truss having a pair of ends which are attached to respective beams extending transverse to the longitudinal axis of the truss comprising:

(a) a pair of spaced apart wooden members, said pair of wooden members forming upper and lower members and being held in their spaced apart position by a plurality of means attached to the wooden members;

(b) a pair of truss hangers fixedly connecting one end of said truss structure to one of said beams, said pair of truss hangers being of like construction but of mirror image configuration, each truss hanger comprising:

(i) a bracket having a first leg disposed in a first plane with first and second ends and two outside edges running between the first and second ends, the first leg having a side which is adapted to engage the width of a beam, a base disposed in a second plane and having first and second ends, the first end of the base being attached to the first end of the first leg at approximately a 90° angle, the base being adapted to engage the top of the beam, and a second leg disposed in a third plane which is substantially parallel to the first plane and which is attached to the second end of the base at an approximate 90° angle, the second leg being adapted to engage a second side of the beam across its width;

(ii) a connecting plate having upper and lower end portions and being disposed in a fourth plane, the connecting plate being attached to the first leg along one of the outside edges of said first leg and with the upper end of the connecting plate being at the same level as the base of said bracket, the fourth plane being substantially perpendicular to the first plane, the connecting plate having a plurality of teeth-like projections extending generally perpendicular from the connecting plate in a direction so as to overlie said first leg, with said projections attached to a side of the upper wooden member of the truss; and

(iii) at least one of the base and the second leg having at least one aperture which is adapted to receive nails or like fasteners for attaching the bracket to the beam;

said connecting plate being positioned with respect to said truss so that the first leg of the bracket is positioned between the truss and the respective beam.

4,561,231

TOWER-FOUNDATION ANCHOR INTERCONNECTION

Robert M. Hoyt; Edward Dziedzic, and William M. Rinehart, all of Centralia, Mo., assignors to A. B. Chance Company, Centralia, Mo.

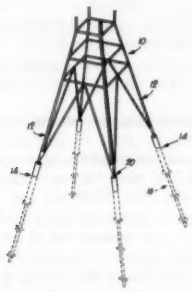
Filed Apr. 29, 1983, Ser. No. 489,861
Int. Cl.[4] E02D *27/00*
U.S. Cl. 52—297 **7 Claims**

1. A foundation for supporting a transmission line tower leg or the like comprising:

an anchor including an elongated shaft adjacent one end thereof, an outwardly-extending, load-bearing element affixed in transverse relation to said shaft, and structure defining a tubular cavity adjacent the other end of said anchor;

an elongated, upright connector member having a lowermost, elongated first portion received in said cavity and an uppermost, second portion having means for securement thereof to said tower leg for supporting the latter,

the transverse dimension of said first portion of the connector member received in said cavity defining structure being sufficiently less than the transverse dimensions of said cavity presenting structure receiving said first portion of the connector member to permit lateral movement of



said first portion within said cavity for initial, multi-directional positioning of said portion in said cavity as may be necessary to allow proper alignment of the connector member with the tower leg notwithstanding nonaxial alignment of the anchor shaft with said tower leg; and

an initially flowable, solidified material filling at least a portion of said cavity and located to rigidly secure said first portion of said connector member in the anchor while serving as the vertical as well as horizontal support for the connector member,

said material having sufficient structural strength in solidified form and being of dimensions to not only freely support said member but also carry the weight presented by said tower leg.

4,561,232

MODULAR TILE WITH POSITIONING MEANS FOR USE WITH AN ACCESS FLOOR PANEL SYSTEM

Robert S. Gladden, Jr., Severna Park; Richard J. Johnson, Baltimore; John C. Kidd, Baltimore, and Robert A. Younkin, Baltimore, all of Md., assignors to Tate Architectural Products, Inc., Jessup, Md.

Continuation of Ser. No. 411,985, Aug. 26, 1982. This application Jun. 22, 1984, Ser. No. 622,408

Int. Cl.⁴ E04F *13/08*

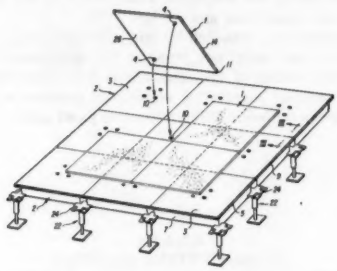
U.S. Cl. 52—385 **18 Claims**

1. A modular tile and access floor panel assembly, comprising:

a plurality of access floor panels of module size, each of said panels having a top surface portion, a side wall and a flange member extending from said side wall so as to directly contact said top surface portion wherein each of said panels has at least one positioning hole formed therein;

a plurality of modular tiles, each of said modular tiles lying exclusively on said top surface portion of said panels and having an outer perimeter edge portion that is equal in width and length to that of each of said panels and engageable with said outer perimeter of said top surface portion of each of said panels, respectively; and

means integrally disposed on a portion of each of said tiles and within said outer perimeter portion of each of said tiles for positioning, indexing and maintaining position modularity of said tiles relative to said top surface portion of each of said panels, respectively, said means for positioning, indexing and maintaining position modularity having a configuration which orients each of said tiles to each of said panels, respectively, such that each of said tiles is removable and replacable without the use of indexing tools or fixtures and each of said tiles is substantially of said panel module size wherein said means for positioning, indexing and maintaining position modularity of said tiles



further comprises at least one form projection extending from said tile which indexes in said positioning hole formed in each of said panels wherein said means for positioning, indexing and maintaining position modularity of said tiles further comprises means operatively connected with each of said tiles and engageable with each of said panels for holding a perimeter portion of each of said tiles to said perimeter portion of each of said panels, respectively, and for preventing lifting and/or curling of each of said tiles along said perimeter thereof or at a corner thereof and wherein said holding means further comprises magnetic tape.

4,561,233

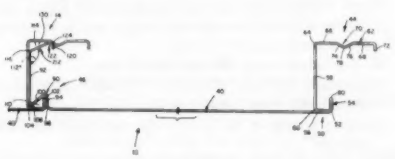
WALL PANEL

James W. Herter, Independence, Mo., and Gary S. Smagiel, Olathe, Kans., assignors to Butler Manufacturing Company, Kansas City, Mo.

Filed Apr. 26, 1983, Ser. No. 488,730

Int. Cl.⁴ E04C *1/30*

U.S. Cl. 52—588 **7 Claims**



1. Wall panel structure for outside use on buildings comprising:

a plurality of elongated panel units of sheet material each having substantially parallel ends lengthwise thereof;

a first leg having a cleft portion thereon;

a first web attached to said first leg;

a hairpin portion attaching said first web to one end of a first panel unit;

an angled leg attached to a second web with the entire leg being at an obtuse angle of 112° with respect to the second web;

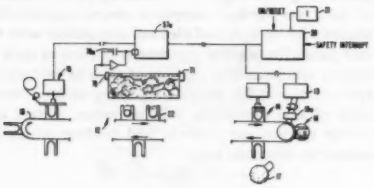
said second web being attached by an offset section having a void space to another end of said panel unit;
said second web being shorter than said first web;
whereupon upon assembly of a second panel unit with said first panel unit, the aforesaid hairpin portion of said first panel unit is received within the void space of the offset section of the second panel unit;
said angled leg having a lip at the free edge thereof for snap engagement with the cleft portion of an adjacent panel unit;
the lip of the angled leg of the second panel unit engaging the cleft portion of the first leg of said first panel unit for maintaining the assembled relationship of the first and second panel units; and
said second web attached by said offset section to another end of said panel unit being at 92° with respect to the central portion of the panel unit so that when two panels are snapped together, a continuous pressure is exerted between the webs of the respective panel units.

4,561,234

PRODUCT TYING MACHINE

Egidio L. Tonus, Castroville, Calif., assignor to California Artichoke and Vegetable Growers Corp., Castroville, Calif.

Filed Dec. 2, 1982, Ser. No. 446,121
Int. Cl.⁴ B65B *27/10, 13/04*
U.S. Cl. 53—399 **38 Claims**



1. A product tying apparatus for use with a supply of wire twist ties, comprising:
means for sequentially conveying a plurality of spaced carriers along a conveyor flight;
means, located at a first station along said flight, for inserting a wire twist tie into each spaced carrier;
a second station located along said flight wherein a product may be inserted into each spaced carrier; and
means, located at a third station along said flight, for twisting the wire twist tie in each spaced carrier securely about the product inserted therein.

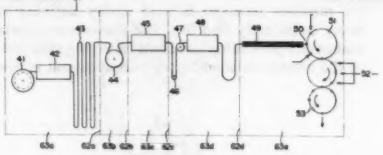
32. A product tying method, comprising:
sequentially moving a plurality of U-shaped product carriers about a conveyor circuit;
inserting a strip of tie from a tie supply source into a tie holder;
cutting said tie from said tie supply source after tie insertion into said tie holder;
retracting a tie holder cover to expose a tie insertion gap;
inserting said tie into one of said carriers;
inserting a product into each spaced carrier;
guiding two tie ends into a tie pick-up position;
grabbing each of said tie ends within a pair of spaced opposing clamp jaws;
rotating said clamp jaws about a tie axis to twist the tie ends securely about said product; and
removing said clamp jaws from said tie ends after said product is tied.

4,561,235

APPARATUS FOR AND METHOD OF PROCESSING AND PACKAGING PHOTOGRAPHIC FILM

Akira Yanagisawa, Akigawa; Hisashi Yazawa, Hino, and Toshio Kato, Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Dec. 15, 1982, Ser. No. 450,027
Claims priority, application Japan, Dec. 21, 1981, 56-207596
Int. Cl.⁴ B65B *61/02*
U.S. Cl. 53—411 **13 Claims**



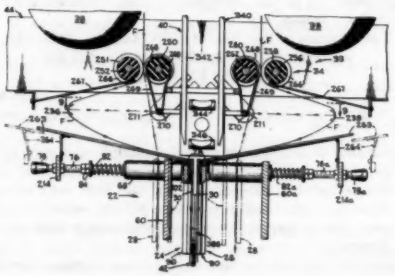
6. A method of processing and packaging photographic film comprising the steps of:
providing a plurality of roll magazines, each of which contains a web of film, each film web having a leading end and a trailing end;
providing a splicer in which the trailing end of one film web is to be joined to the leading end of another film;
continuously advancing a first portion of one film web along a path while continuously performing operations thereon;
continuously accumulating a second portion of said one film web intermediate its ends;
advancing another film web along said path while said first portion of said one film web is still advancing for joining the leading end of said other film web and the trailing end of said one film web;
and momentarily stopping the advance of said leading end of said other film web and the advance of said trailing end of said one film web and effecting splicing of said ends while they are stopped and while at least said first portion of said one film web continues to advance.

4,561,236

METHOD AND APPARATUS FOR PACKAGING ARTICLES SUCH AS FRUIT

William C. Kreamer, San Jose, Calif., assignor to FMC Corporation, Chicago, Ill.

Division of Ser. No. 418,118, Sep. 14, 1982. This application May 22, 1985, Ser. No. 736,910
Int. Cl.⁴ B65B *41/16, 11/50*
U.S. Cl. 53—509 **12 Claims**



1. In an apparatus for packaging an article within thermosealing film, which apparatus includes an intermittently opened and closed film clamp, a low inertia film drive comprising;

a film supply roll containing a strip of film,

a pair of continuously driven nip rolls on a first side of said film clamp for continuously withdrawing the film strip from the supply roll at a predetermined speed,

a pair of soft surfaced rolls on the other side of said film clamp for receiving the film strip,

means for driving said pair of soft rolls for pulling said film strip taut when said clamp is open, and

clutch means interposed between said drive means and said soft surfaced rolls for declutching said soft surface rolls after said film clamp terminates movement of said film on said other side of said clamp means, the continuous film feed on said first side accumulating film in a loop of film.

4,561,237

APPARATUS FOR PACKING ARTICLES FED IN A CONTINUOUS FLOW

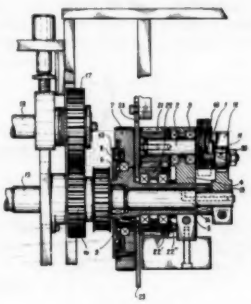
Johannes D. Van Maanen, Berkel en Rodenrijs, Netherlands, assignor to Tevopharm Schiedam B.V., Schiedam, Netherlands

Continuation of Ser. No. 281,464, Jul. 8, 1981, abandoned. This application Sep. 10, 1984, Ser. No. 648,628

Claims priority, application Netherlands, Jul. 10, 1980, 8003991

Int. Cl.⁴ B65B *9/12, 51/30*

U.S. Cl. 53—548 **4 Claims**



1. In an apparatus for packing articles for bundles of articles, said apparatus having a driving shaft and at least two rollers mounted for rotation and for forming a transverse sealing seam between the articles, said rollers being in driving connection with each other: a mechanism interposed between said driving shaft and one of said rollers, for rotating the rollers with a non-constant rotational velocity above zero, said mechanism comprising a crank arm which is connected, for a rotational movement around an axis extending perpendicular to the arm, to a coupling member mounted for rotation around an axis extending in spaced relation parallel to the rotational axis of the crank arm and connected with the driving shaft, so that upon rotation of the coupling member the axis of rotation of the crank arm moves along a circular path with a constant velocity, a driving cam provided at said crank arm and shiftable in a slot formed in a follower member extending parallel to the crank arm and fixed to a shaft which is in driving connection with one of said rollers, said driving cam being mounted for movement in radial direction with respect to the axis of rotation of said crank arm, the axis of said shaft extending perpendicular to the follower member in spaced apart relation with the driving cam, said slot extending in radial direction with respect to said axis of said shaft, said crank arm being provided with means for adjusting the position of said cam with respect to the axis of rotation of said crank arm so that every time the axis of rotation of the crank arm moves along a complete circular path said crank arm is rotated more than one time over 360° around said axis.

4,561,238

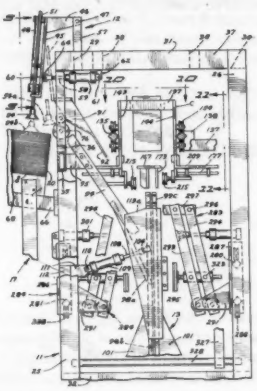
BAG FILLING AND CLOSING APPARATUS

Robert E. Odom, Blaine, Minn., assignor to Bemis Company, Inc., Minneapolis, Minn.

Filed May 25, 1984, Ser. No. 613,975

Int. Cl.⁴ B65B *43/30*

U.S. Cl. 53—573 **25 Claims**



1. In apparatus for feeding a flat folded bag having opposite side walls, a top peripheral edge defining a bag mouth, a bottom edge, a leading edge and a trailing edge from a bag magazine and moving the bag to a filling station, a longitudinally elongated frame having a front end and a rear end, a bag positioner assembly mounted on the frame for supporting a flat folded bag with the top edge at a higher elevation than the bottom edge that includes transversely spaced first and second bag side wall support members for having a flat folded bag fed therebetween, first means for for limiting the downward movement of the flat bag between the side wall supports and abutting against the bag bottom edge so that the bag is inclined forwardly in a downward direction, and operable second means movable between a first position extending rearwardly of the side wall support members to limit the angle of inclination of the flat bag when it abuts against the first means and a second position straightening the flat bag to extend vertically upright between the side wall support members, operable third means for removing a flat folded bag from the magazine and feeding the bag to move downwardly between the side wall support members to have the bag bottom edge engage the first means, a carriage assembly mounted on the frame for clampingly engaging the bag in its upright position and moving the bag from the positioner assembly to a bag filling station, and control means for operating the operable means.

4,561,239

PIVOTAL HANDLE MOUNT

Glyn F. Cook, Barrie, Canada, assignor to Black & Decker Inc., Newark, Del.

Filed Aug. 3, 1984, Ser. No. 637,593

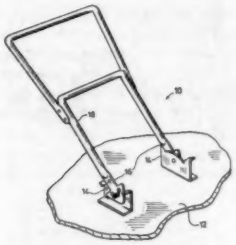
Claims priority, application Canada, Dec. 15, 1983, 443335

Int. Cl.⁴ A01D *53/00*

U.S. Cl. 56—320.1 **4 Claims**

1. A swing-over handle attachment system for a gardening appliance, comprising a pair of mounting bracket members attached to the appliance, bifurcated handle means having a pair of attachment foot portions in mutually spaced apart relation for individual attachment to a respective bracket, each foot portion having a single pivot pin secured thereto and extending in substantially axially aligned relation with the other pivot pin, each said pivot pin connecting a said foot portion in moveable and pivotal relation with a respective said bracket member, each said bracket member having a plurality

of interconnected pin seats to receive a journal portion of a said pivot pin in secured pivotal relation therein, having slots extending upwardly between and interconnecting said pin seats, the width of said slots being less than the diameter of said pin journal portions, to preclude passage of a said pin journal portion therethrough, each said pin having a reduced shank portion for entry within said slots, to permit relocation of said pin journal portion in a selected said pin seat while retaining



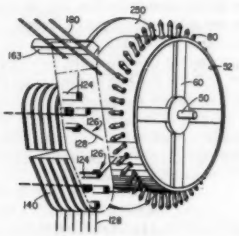
connection of said handle means with said bracket members, two outer pin seats providing two working positions for said handle, wherein foot portions of said handle spaced from said pins are, in use, located in secured non-pivotal abutting relation with adjoining fixed abutment portions of said appliance and a pin seat intermediate said two outer pin seats providing a third working position for said handle, for free pivotal movement of the handle about said intermediate seat between said two working positions.

4,561,240

APPARATUS FOR RETRIEVING OBJECTS FROM THE GROUND

Joseph L. Moore, Abilene; R. Keith Moore, Midland, and Dennis K. Moore, Richardson, all of Tex., assignors to Proficient Systems, Inc., Richardson, Tex.

Filed Sep. 9, 1983, Ser. No. 531,304
Int. Cl.[4] A01D *46/00*; E01H *1/04*
U.S. Cl. 56—328 R **9 Claims**



1. In a device for retrieving objects from the ground, the device having a ground engageable rotatable drum mounted on an axle and having a plurality of drum fingers extending radially outwardly from said drum for engageably receiving the objects therebetween as said drum rotates in a first direction, the improvement comprising:

a. a first feed member having a first rotatable member, first drive means and a plurality of first spring fingers generally extending radially outwardly from said first rotatable member; said first drive means selectively rotating said first rotatable member;

b. a second feed member having a second rotatable member, second drive means, and a plurality of second spring fingers generally extending radially outwardly from said second rotatable member; said second drive means selectively rotating said second rotatable member;

c. an adjustable mounting mechanism having said first feed member and said second feed member mounted thereon;

(i) said second feed member being mounted substantially above said first feed member and being oriented for said second spring fingers to remove trapped objects from between said drum fingers and;

d. an adjustment mechanism having means for rotating said mounting mechanism about said drum axle to selectively position said first feed member with respect to the ground, and simultaneously adjust said second feed member to maintain a constant spacing between said second feed member and said first feed member while simultaneously maintaining a constant distance between said second feed member and the drum;

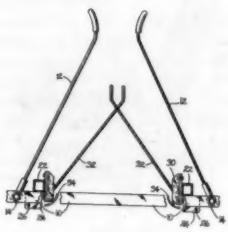
e. whereby said first feed member is selectively positionable to direct objects from the ground and into said drum fingers, and said second feed member is simultaneously selectively positionable to remove objects from said drum fingers and direct them toward a hopper.

4,561,241

METHOD AND HARVESTER ATTACHMENT FOR STABILIZING GRAPEVINES DURING HARVESTING

Lynn V. Burns, Rte. 3, Box 3120, Toppenish, Wash. 98948

Filed Jun. 21, 1984, Ser. No. 623,231
Int. Cl.[4] A01D *46/00*
U.S. Cl. 56—330 **8 Claims**



1. Wire supported vine row stabilizing apparatus for attachment to a vine row crop harvester having plant shaking mechanism supported by the harvester frame, the stabilizing apparatus comprising:

(a) stabilizer mounting means arranged for attachment to the frame of a harvester, and

(b) stabilizer means on said mounting means arranged to be disposed forwardly of the plant shaking mechanism of the harvester and configured to engage a portion of the wire supported row forwardly of the portion of the vine row being acted upon by the shaking mechanism of the harvester, for preventing the shaking of the vines being harvested from being transmitted to the vines forwardly thereof.

4,561,242

START SPINNING ARRANGEMENT FOR AN OPEN END FRICTION SPINNING MACHINE

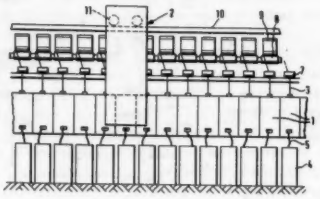
Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7347 Bad Ueberkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker and Fritz Stahlecker, both of, Fed. Rep. of Germany

Filed Apr. 26, 1984, Ser. No. 604,377
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1983, 3315034
Int. Cl.[4] D01H *15/02*
U.S. Cl. 57—263 **19 Claims**

1. Apparatus for piecing yarn at a spinning unit of an open end friction spinning machine of the type having a yarn form-

ing region composed of friction surface means, fiber feeding means for feeding individual fibers to the yarn forming region, yarn withdrawal means for withdrawing formed yarn from the yarn forming region, and suction means for applying suction air flow to assist in holding the forming yarn in the yarn forming region, said apparatus comprising:

yarn returning means for returning a yarn end portion back over the region of the fiber feed opening of the fiber feeding means preliminary to initiating the piecing procedure, and



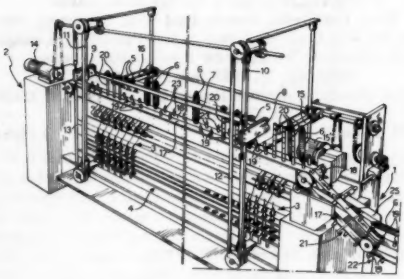
yarn guide element means provided at each spinning unit in the region opposite the yarn withdrawal end of the yarn forming region for securely holding the yarn end portion returned back over the region of the fiber feed opening of the fiber feeding means preliminary to initiating the start spinning procedure, said yarn guide element means serving to retain the yarn end in a position downstream of the yarn forming region until the activation of the yarn withdrawal means.

4,561,243

SPINNING OR TWISTING MACHINE HAVING DEVICES FOR THE SIMULTANEOUS AUTOMATIC REMOVAL OF ALL COPS

Piero Gaudino, Cossato, Italy, assignor to Officine Gaudino di P. Gaudino & C.S. a.s., Cossato, Italy

Filed Dec. 14, 1983, Ser. No. 561,075
Claims priority, application Italy, Dec. 12, 1982, 68502 A/82
Int. Cl.⁴ D01H *9/04*
U.S. Cl. 57—274 **14 Claims**



1. A ring spinning machine comprising:

row of spindles for removably receiving spools;

a cop removal means for simultaneously removing cops in the direction axial to the spindles;

a conveyor means extending longitudinally of the row of spindles having a first row of cop receiving means for receiving cops from said cop removal means and having a second row of cop receiving means for carrying spools;

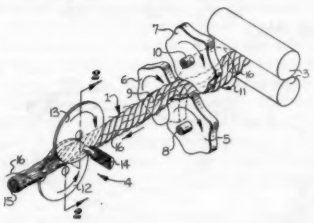
a conveyor displacement means for displacing the conveyor means transverse to the row of spindles, wherein said conveyor means occupies a first position outside a plane of said spindle axes, a second position in which a plane containing said first row of cop receiving means coincides with the plane of said spindle axes, and a third position in which a plane containing said second row of cop receiving means coincides with the plane of said spindle axes.

4,561,244

METHOD AND APPARATUS FOR SPINNING YARN AND RESULTING YARN PRODUCT

Herbert Turk, Remscheid, and Herbert Schiminski, Hückeswagen, both of Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik AG, Remscheid, Fed. Rep. of Germany

Filed Nov. 17, 1983, Ser. No. 552,740
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1982, 3242718; Nov. 26, 1982, 3243844
Int. Cl.⁴ D01H *7/92, 13/04;* **D02G** *3/38;* **B65H** *57/28*
U.S. Cl. 57—336 **29 Claims**



1. A method for producing a spun yarn comprising the steps of

advancing a yarn which includes staple fibers along a path of travel,

deflecting the advancing yarn by physically contacting the yarn with a moving guide member so as to oscillate the advancing yarn in two dimensions transverse to its advancing direction, and so as to cause fibers to be loosened on the surface of the yarn, and then

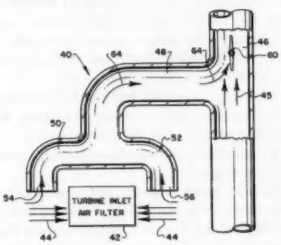
wrapping the loosened fibers spirally about the body of the advancing yarn.

4,561,245

TURBINE ANTI-ICING SYSTEM

Bennett D. Ball, Anchorage, Ak., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation of Ser. No. 551,772, Nov. 14, 1983, abandoned.
This application May 16, 1985, Ser. No. 735,285
Int. Cl.⁴ F02C *7/047*
U.S. Cl. 60—39.02 **5 Claims**



1. The method of prevention of icing at the air inlet of a gas turbine incorporating an exhaust stack vented to atmosphere and interconnected with said air inlet by means of a recirculation line comprising the steps of:

(a) maintaining a constant uninterrupted flow path between the opposite ends of said recirculation line;

(b) establishing a back pressure within said exhaust stack in

the presence of icing conditions sufficient to cause exhaust gas to flow through said recirculation line from said exhaust stack to said air inlet and thereby to heat ambient air entering said inlet; and

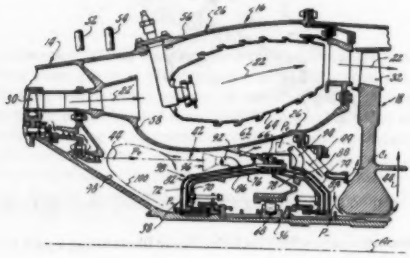
(c) creating a partial vacuum within said exhaust stack upon cessation of said icing conditions sufficient to cause ambient air to flow through said recirculation line from said air inlet to said exhaust stack thereby purging said recirculation line of residual exhaust gases.

4,561,246

BEARING COMPARTMENT FOR A GAS TURBINE ENGINE

Edward J. Hovan, Manchester, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 23, 1983, Ser. No. 564,996
Int. Cl.⁴ F02C *7/06, 7/28*
U.S. Cl. 60—226.1 **7 Claims**



1. In a gas turbine engine of the type having a compressor section, a turbine section, an annular flow path for working medium gases extending through the compressor section to the turbine section, a rotor assembly and a stator assembly which bound the working medium flow path, the stator assembly being spaced from the rotor assembly leaving an annular inner cavity therebetween which receives gases from the working medium flow path at a first temperature, a bearing disposed in the inner cavity which extends between the stator assembly and the rotor assembly for supporting the rotor assembly and a bearing housing which includes a casing extending circumferentially about the bearing to define a bearing compartment, the casing having at least one end adjacent the rotor assembly, the housing further including a seal means at the end which extends into proximity with the rotor assembly and a second seal means at the second end which extends into proximity with the rotor assembly, the improvement which comprises:

a flow path for cooling air for the turbine section which extends through the inner cavity from the compressor section to the turbine section and which receives gases from the working medium flow path;

means for creating an annular buffer cavity adjacent the seal means, the annular buffer cavity extending between the bearing compartment and the inner cavity;

means for pressurizing the working medium gases at a first region of the engine;

means for flowing gases from the first region of the engine to the buffer cavity adjacent the seal means, said gases in the buffer cavity having a higher static pressure than the gases in the inner cavity adjacent the buffer cavity and the bearing compartment under normal operative conditions;

means for cooling said gases from the first region as the gases are flowed from the first region to the buffer cavity such that the gases are cooled to a second temperature which is less than the first temperature of the inner cavity;

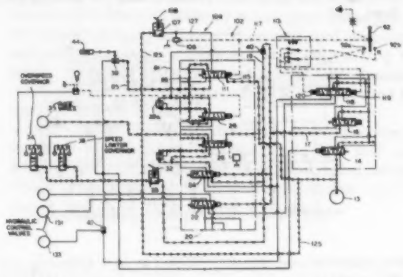
wherein the temperature of the gases in the buffer cavity causes the gases to have a greater autoignition time characteristic than the gases in the inner cavity adjacent the seal means.

4,561,247

HYDRODYNAMIC TRANSMISSION REVERSAL CONTROL

Gene R. Rose, Buchanan, Mich., assignor to Clark Michigan Company, Buchanan, Mich.

Filed Feb. 21, 1984, Ser. No. 581,634
Int. Cl.⁴ F16D *33/00*
U.S. Cl. 60—335 **15 Claims**



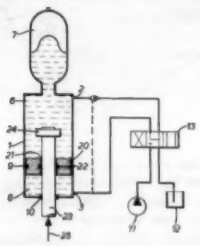
1. A control system for a reversible drive apparatus which includes an engine and a transmission having a forward hydraulic torque converter, a reverse hydraulic torque converter and means for selectively filling one of the torque converters with hydraulic fluid to provide operation of the drive apparatus in the desired direction, means for operating the engine at a selected operating speed, and means for selectively reversing the drive apparatus from one mode to the other mode including an operator control member, comprising means responsive to movement of said operator control member which upon initial movement thereof causes the engine speed to drop to idling and upon further movement thereof causes the engine speed to increase and the previously inactive torque converter to fill at a rate responsive to the movement of said operator control member.

4,561,248

HYDRAULIC SHOCK-ABSORBING JACK

René Quin, Harkirchen, France; Paul Wiet, Randaberg, Norway, and Jean-Louis Migliarese-Caputi, Paris, France, assignors to Compagnie Francaise des Petroles, Paris, France

Filed Dec. 21, 1983, Ser. No. 563,918
Claims priority, application France, Dec. 22, 1982, 82 21526
Int. Cl.⁴ F15B *15/22*
U.S. Cl. 60—413 **1 Claim**



1. A double-acting hydraulic jack for installation and use underwater and including a cylinder (1), a piston (20) slidably and sealingly disposed in said cylinder and defining therewith a first actuating chamber (6) on one side of said piston and a second actuating chamber (8) on the other side of said piston, a first inlet (2) for supplying actuating liquid to said first chamber, a second inlet (3) for supplying actuating liquid to said

second chamber, an accumulator (7) of elastically variable volume, means connecting said accumulator to said first chamber, and an actuated rod (23) associated with said piston and extending axially through the second chamber and outwardly of the cylinder through a liquid sealing aperture (10) in one end thereof, characterized by: means for preventing abrupt pressure drops in the second chamber due to shocks in a retraction direction being applied to the piston rod to thereby avoid the breach of said second chamber and the attendant inflow of surrounding water, said preventing means comprising an axial passage (21) defined in the piston, the rod extending slidably and sealingly through the passage with one end thereof projecting into the first chamber, an enlarged head (24) fixed to said one end of the rod and extending radially outwardly therefrom to retain the rod within the piston passage, and the remainder of the rod being smoothly cylindrical without any radial enlargements or limitations to its free and unrestricted sliding travel within the piston passage throughout the entire length of the rod inside the cylinder, whereby shocks applied to the rod in the retraction direction thereof and externally of the cylinder displace the rod within the piston but not the piston within the cylinder, with the decreased volume within the first chamber due to the further extension of the rod thereinto being compensated by an attendantly decreased volume within the accumulator.

4,561,249

CONTROL SYSTEM FOR HYDRAULIC CIRCUIT APPARATUS

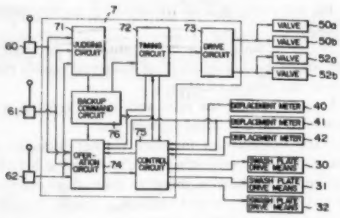
Hiroshi Watanabe; Eiki Izumi; Yukio Aoyagi; Kazuo Honma, and Kichio Nakajima, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 28, 1982, Ser. No. 426,096

Claims priority, application Japan, Oct. 2, 1981, 56-156176

Int. Cl.⁴ F16H *39/46*

U.S. Cl. 60—421 **2 Claims**



1. A control system for a hydraulic circuit apparatus including at lest first and second hydraulic pumps of a variable displacement type, a first hydraulic actuator arranged for hydraulic connection with said first pump through a first valve means to be driven thereby, a second hydraulic actuator arranged for respective selective hydraulic connection with said first and second pumps through second and third valve means, an order of priority for the hydraulic connection being set beforehand in such a manner that when an operation signal for the second hydraulic actuator is received while the first pump is inoperative, the first pump takes priority over the second pump for hydraulic connection with the second actuator and, when an operation signal for the first actuator is received while the first pump is in hydraulic connection with the second actuator, the first actuator takes priority over the second actuator for hydraulic connection with the first pump and the second actuator is brough into hydraulic connection with the second pump, the displacement volume of the first pump and switching of the second valve means are controlled in such a manner that, when the first pump which is in hydraulic connection with the second actuator is to be brought into hydraulic connection with the first actuator, the displacement volume of the first pump is once returned to zero before changing the hydraulic connection, the control system comprising:

first means for judging whether the first pump is in hydraulic connection with the second actuator when an operation signal for the first actuator is received, and for generating a command for backing up a reduction in a supply of hydraulic fluid in the second actuator simultaneously when the displacement volume of the first pump begins to return to zero, when it is judged that the first pump is in hydraulic connection with the second actuator;

second means for generating a command for switching the third valve means to an open position in accordance with the backup command from the first means;

third means for generating a command for initiating a displacement of the second pump in accordance with the backup command from the first means, said third means includes means for deciding target displacement volumes for the first and second pumps based on the operation signal for the second actuator, means for selecting the decided target displacement volume as a target displacement volume for the first pump in the absence of the backup command from the first means, and means for selecting zero as a target displacement volume for the first pump and the decided target displacement volume as a target displacement volume for the second pump in the presence of the backup command from the first means; and

fourth means for generating a command in accordance with the backup command from the first means for rendering an absolute value of a rate of change in a displacement volume of the first pump upon returning to zero and absolute value of a rate of change of the displacement volume of the second pump after a starting of its displacement substantially equal to each other and larger than a predetermined maximum value of rates of change in the displacement volume of the first and second pumps during normal operation thereof.

4,561,250

HYDRAULIC DRIVE SYSTEM HAVING A PLURALITY OF PRIME MOVERS

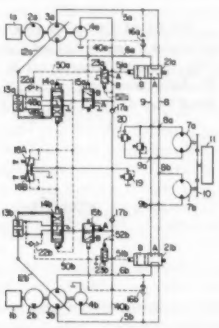
Yukio Aoyagi; Eiki Izumi, both of Ibaraki; Takeshi Yamaguchi, Tsuchiura, and Sotaro Tanaka, Ibaraki, all of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

Filed Feb. 5, 1982, Ser. No. 346,249

Claims priority, application Japan, Feb. 10, 1981, 56-17468; Feb. 10, 1981, 56-17469

Int. Cl.⁴ F15B *11/16*

U.S. Cl. 60—430 **10 Claims**



8. A hydraulic drive system including at least one hydraulic actuator, a plurality of variable displacement hydraulic pumps, each of said hydraulic pumps being connected to said hydraulic actuator in a manner to form a closed hydraulic circuit

therewith and said hydraulic pumps being connected in parallel with each other, and a plurality of prime movers each connected to one of said plurality of hydraulic pumps to drive the same, characterized by:

valve means each associated with one of said hydraulic pumps to fluidly and selectively shut off the hydraulic pump associated therewith from said hydraulic actuator and the other hydraulic pump, said valve means each comprise a two position directional control valve formed with two input ports communicating with one of the hydraulic pumps and two output ports communicating with the actuator, said two position directional control valve being movable between a first position in which the two input ports are brought into communication with each other end the two output ports are shut off from each other and a second position in which the two input ports and the two output ports are connected to each other, wherein said directional control valve comprises a pilot-operated valve normally disposed in the first position; and

control means each associated with one of said prime movers to control said valve means in accordance with an operating condition of the prime mover in such a manner that when the prime mover is not in a normal operating condition, the hydraulic pump connected to the prime mover not normally operating is fluidly shut off from said hydraulic actuator and the other hydraulic pump, said control means for said valve means each comprise additional means operative to control said valve means in response to the flow rate of pressure fluid delivered by the hydraulic pump, to thereby fluidly shut off the hydraulic pump from said hydraulic actuator and the other hydraulic pump when the flow rate of pressure fluid delivered by the hydraulic pump is essentially zero, and wherein said control means each comprise a hydraulic pilot pump driven by said prime mover, a shuttle valve communicating with opposite two pressure chambers of a control cylinder which is provided to drive displacement volume adjusting means for the hydraulic pump, first conduit means supplying an output of said shuttle valve to the pilot operated directional control valve as pilot pressure, the pilot operated two-position change-over valve mounted in said first conduit means and movable between a first position in which the directional control valve has a pilot pressure released therefrom and a second position in which said shuttle valve is brought into communication with the directional control valve, and a second conduit means for supplying pressure fluid delivered by said pilot pump to said change-over valve as a pilot pressure.

4,561,251

HYDRAULIC APPARATUS

Michel-Antoine Moret, Geneva; Gérard Cuénoud, Grand-Lancy, and Pierre-Jean Jousson, Geneva, all of Switzerland, assignors to Les Produits Associes LPA SA, Switzerland

Filed May 4, 1982, Ser. No. 374,631
Int. Cl.⁴ F15B *7/02*
U.S. Cl. 60—537 **22 Claims**

1. A hydraulic apparatus comprising:

(a) a liquid pulse generator which generates liquid pulses having a wavelength;

(b) a hydraulic machine for transforming the energy of liquid pulses into mechanical energy; and

(c) a pipe filled with a liquid and connected at one end to the pulse generator and at a second end to the hydraulic machine to transmit liquid pulses from the pulse generator to the hydraulic machine;

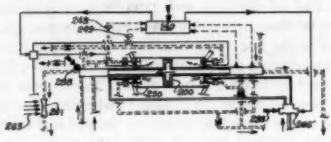
wherein the pipe has a length which is an odd multiple of the quarter-wavelength of the liquid pulses generated by the generator after said generator has reached a steady state condition.

4,561,252

FREE PISTON EXTERNAL COMBUSTION ENGINES

Constant V. David, 4952 Field St., San Diego, Calif. 92110

Filed Mar. 6, 1984, Ser. No. 586,812
Int. Cl.⁴ F02B *71/04*
U.S. Cl. 60—595 **11 Claims**



1. An external combustion engine comprising:

a combustion member including a sleeve having an end closure and an ignition means at each end thereof, inlet and outlet valving means for introducing compressed air and exhausting combusted gases through each end closure, and a free piston mounted in the sleeve for sliding reciprocating axial motion between the end closures and defining a combustion chamber between each end closure and a corresponding end of the piston;

means for compressing the air and introducing the compressed air in the combustion chambers through the inlet valving means;

means for receiving and expanding the exhausted combusted gases to drive the air compressing means and a power delivery member;

means for introducing fuel for burning in the combustion chambers;

means for detecting the axial location of the piston as it reciprocates and for generating electrical signals representative of the piston location;

means for controlling the inlet and outlet valving means in response to the electrical signals; and

wherein the combustion member further includes a stem connected to and extending axially from each end of the piston and a combustion member appendage connected to each end of the sleeve and extending axially therefrom for receiving and guiding a corresponding stem, and structural means in the stem and combustion member appendage for imparting a predetermined guided rotational motion to the piston as it reciprocates axially.

4,561,253

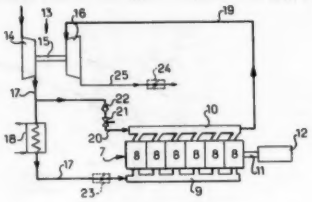
METHOD OF OPERATING SUPERCHARGED DIESEL ENGINE WITH MODIFIED VALVE LIFT AND BYPASSED INTAKE AIR

Rémi Curtil, Montlignon, France, assignor to Societe d'Etudes de Machines Thermiques SEMT, Saint Denis, France

Continuation of Ser. No. 416,076, Sep. 8, 1982, abandoned. This application Feb. 28, 1985, Ser. No. 706,900
Claims priority, application France, Sep. 10, 1981, 81 17177
Int. Cl.⁴ F02B *37/00*
U.S. Cl. 60—606 **4 Claims**

1. A method of operating a four-stroke cycle supercharged diesel engine having at least one cylinder, each cylinder being provided with a piston reciprocating between top dead center and bottom dead center positions, an intake valve, an exhaust valve, and an exhaust manifold for the exhaust gases from the engine, the method including the steps of fully opening the exhaust valve at the beginning of an exhaust stroke; opening the intake valve prior to top dead center at the beginning of the

intake stroke following said exhaust stroke; at least partially closing the exhaust valve during a major part of said intake stroke such that there is a partial overlap of the opening periods of the exhaust valve and intake valve; partially reopening the exhaust valve prior to bottom dead center at the end of the intake stroke; closing the intake valve at a fixed crank angle after the partial reopening of the exhaust valve and prior to bottom dead center at the end of the intake stroke; and closing the exhaust valve after closing the intake valve, wherein the improvement comprises:



bypassing part of a flow of compressed intake air around the engine at engine loads less than 80% of the full load operation of the engine; and

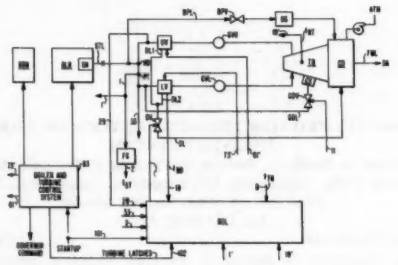
directing said bypassed flow of compressed intake air into the exhaust manifold for the exhaust gases flowing from the engine at an upstream end of said exhaust manifold such as to decrease the difference between the intake air pressure and the exhaust pressure for improving the filling factor of the engine.

4,561,254

INITIAL STEAM FLOW REGULATOR FOR STEAM TURBINE START-UP

Alan Martens, Berwyn; Milton M. Hobbs, Marple Township, Delaware County, and Gerald A. Myers, Swarthmore, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 25, 1984, Ser. No. 664,641
Int. Cl.[4] F01K *13/02*
U.S. Cl. 60—660 **4 Claims**



1. In a system including a heat recovery steam generator and a steam turbine coupled to an electrical generator to be latched when loading the steam turbine, admission valve means for steam generated by said steam generator to said steam turbine, a condenser associated with said steam turbine, the combination of:

drain line means for fluidly connecting said steam generator to said condenser from a location close to said admission valve means;

drain valve means in said drain line means having a closed position blocking passage of steam to the condenser while said admission valve means are closed and an open position allowing passage of steam from said location to the condenser prior to said admission valve means being open;

valve control means responsive to a start-up condition of said heat recovery steam generator for controlling said drain valve means to adopt said open position, and responsive to a latched condition of said electrical generator for controlling said drain valve means to adopt said closed position; and

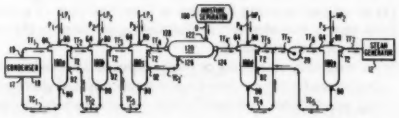
logic control means being associated with said valve control means and responsive to an indication that the steam from said steam generator exceeds minimal pressure and temperature conditions, for establishing a preliminary condition prior to said latched condition.

4,561,255

POWER PLANT FEEDWATER SYSTEM

George Silvestri, Jr., Maitland, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 24, 1983, Ser. No. 507,608
Int. Cl.[4] F01K *7/34*
U.S. Cl. 60—678 **5 Claims**



1. A steam turbine power plant, comprising:

A low pressure turbine element having a first extraction point;

a high pressure turbine element having a second extraction point;

a condenser having an inlet port and an outlet port;

a steam generator having an inlet port, said inlet port of said steam generator being connected in fluid communication with said outlet port of said condenser;

a first feedwater heater connected in fluid communication between said outlet port of said condenser and said inlet port of said steam generator, said first feedwater heater having a vapor inlet connected in fluid communication with said first extraction port of said low portion turbine element, said first feedwater heater having a condensate outlet connected in fluid communication with said inlet port of said condenser;

a second feedwater heater connected in fluid communication between said first feedwater heater and said inlet port of said steam generator, said second feedwater heater having a vapor inlet connected in fluid communication with said second extraction port of said high pressure turbine element, said second feedwater heater having a condensate outlet connected in fluid communication with said inlet port of said steam generator;

a third feedwater heater connected in fluid communication between said outlet port of said condenser and said second feedwater heater, said third feedwater heater being connected in parallel with said first feedwater heater, said third feedwater heater having an inlet port and an outlet port, said outlet port of said third feedwater heater being connected in fluid communication with said inlet port of said condenser;

a reheater having a drain outlet connected in fluid communication with said inlet of said third feedwater heater; and

whereby feedwater can flow sequentially from said outlet port of said condenser, through said first feedwater heater, through said second feedwater heater and to said inlet port of said steam generator with a parallel path from said outlet port of said condenser, through said third feedwater heater, through said second feedwater heater to said inlet port of said steam generator.

4,561,256

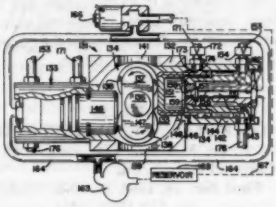
EXTERNAL COMBUSTION ENGINE

Albert J. Molignoni, Butte, Mont., assignor to Power Shaft Engine, Butte, Mont.

Continuation-in-part of Ser. No. 455,745, Jan. 5, 1983, abandoned. This application Nov. 25, 1983, Ser. No. 554,603

Int. Cl.⁴ F01K *9/02*

U.S. Cl. 60—692 **20 Claims**



1. An engine utilizing a heated vapor, comprising:

(a) an engine housing forming at least one pair of cylinders;

(b) a piston mounted for reciprocating motion on the axis of each of said cylinders;

(c) a rotatably mounted power output shaft positioned between said pistons, the axis of rotation of said shaft extending substantially perpendicular to said axes of reciprocation of said pistons;

(d) a roller assembly connecting said pistons with said shaft, said assembly including two rollers which roll across said pistons as said shaft rotates and said pistons reciprocate, said rollers being on opposite sides of said axis of said output shaft, whereby each of said pistons moves through a complete cycle of reciprocation for each roller in each rotation of said shaft;

(e) said cylinders and said pistons forming expansion chambers therebetween, and said housing having vapor inlet and outlet ports therein leading to and from said chambers, and vapor under pressure passing through said inlet ports to said expansion chambers exerting forces on said pistons for turning said shaft.

4,561,257

GAS TURBINE ENGINE COMBUSTION APPARATUS

William C. T. Kwan, Alvaston, and Anthony Pidcock, Shelton Lock, both of England, assignors to Rolls-Royce Limited, London, England

Continuation-in-part of Ser. No. 373,781, Apr. 30, 1982, abandoned. This application Jul. 26, 1984, Ser. No. 634,453

Claims priority, application United Kingdom, May 20, 1981, 8115438

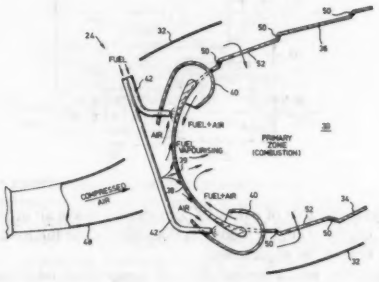
Int. Cl.⁴ F23R *3/20*

U.S. Cl. 60—737 **12 Claims**

1. A gas turbine engine combustion apparatus comprising:

at least one flame tube defining a combustion chamber of a fuel vaporising type, said at least one flame tube including an upstream end wall having an exterior upstream surface upon which compressed air is discharged to cool the same and an interior downstream surface upon which fuel is directly discharged and vaporised, said at least one flame tube having a primary combustion zone within the combustion chamber downstream of said downstream surface of said upstream end wall; a plurality of flow guide ducts operatively associated with and extending through said upstream end wall of said at least one flame tube, said plurality of flow ducts being arranged in at least one circumferential row about said upstream end wall of said frame tube, each of said flow guide ducts including a first limb portion positioned on said exterior upstream surface of said upstream end wall and having an inlet for compressed air and a second limb portion positioned on said interior downstream surface of said upstream end wall and having an outlet immediately adjacent to said interior downstream surface of said upstream wall for directing a discrete flow of fluid therefrom directly onto said interior downstream surface; and

fuel ducts positioned entirely on the exterior of said flame tube and associated with said first limb portion of at least some of said flow guide ducts for injecting fuel into the flow of compressed air therein to provide a fuel and air mixture, each of said fuel ducts having orifice means positioned at the upstream end of the said associated first limb portion for injecting fuel into the flow guide ducts, said first limb portion positioned on said exterior upstream



surface of said upstream end wall having an elongated length which coupled with positioning of said orifice means of said fuel ducts in the upstream end thereof sufficient to enable fuel and air flowing therethrough to be substantially fully mixed before flowing into said second limb portion, said second limb portion having a short length extending a small amount into said flame tube so as to minimize area for vaporisation of the fuel and air mixture prior to discharge from the outlet of said second limb portion directly onto said interior downstream surface of said stream end wall where the fuel is vaporised prior to burning in the primary combustion zone of said flame tube.

4,561,258

GRAVITY-FED LOW PRESSURE CRYOGENIC LIQUID DELIVERY SYSTEM

Howard D. Brodbeck, Berwyn, and Martin A. Krongold, Aston, both of Pa., assignors to MG Industries, Valley Forge, Pa.

Filed Jan. 24, 1985, Ser. No. 694,469

Int. Cl.⁴ F17C *13/02*

U.S. Cl. 62—49 **12 Claims**

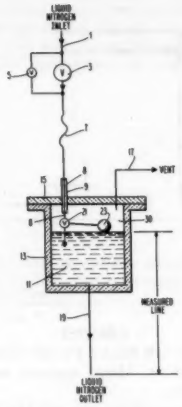
1. Apparatus for delivering cryogenic liquids at controlled low pressures, comprising:

(a) container means, adapted for storing a cryogenic liquid, the container means having an insulated wall,

(b) inlet conduit means for introducing cryogenic liquids into the container means, the inlet conduit means having an interior portion and a flexible exterior portion, the inlet conduit means extending through an adjustable sleeve means mounted in the wall of the container means, wherein the length of the interior portion of the inlet conduit means can be adjusted by varying the position of the sleeve means,

(c) a float ball and float valve assembly, disposed within the container means, for regulating the height of the liquid

within the container means, the float ball and valve being connected to the inlet conduit means, and



(d) outlet conduit means, the outlet conduit means being disposed at the bottom of the container means, wherein liquid can flow by gravity out of the container means.

4,561,259

METHOD OF OPERATING A BIMODAL HEAT PUMP AND HEAT PUMP FOR USE OF THIS METHOD

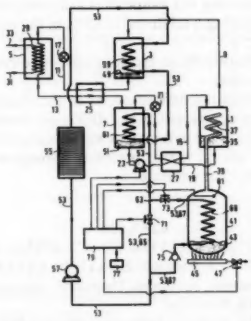
Willem L. N. van der Sluys, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 531,113, Sep. 12, 1983, abandoned. This application Jan. 31, 1985, Ser. No. 696,627

Claims priority, application Netherlands, Jul. 8, 1983, 8302437

Int. Cl.⁴ F25B *15/00*

U.S. Cl. 62—101 **5 Claims**



1. A method of operating a bimodal heat pump, said heat pump operating in a first mode as an absorption heat pump and in a second mode as a device for indirectly heating a heat-transport medium, which comprises in said first mode heating by heat exchange a generator containing a solution of a working medium in a solvent to separate a part of the dissolved working medium in the gaseous state from the solvent; passing the separated gaseous working medium to a condenser for liquefaction by the giving up of thermal energy to the heat-transport medium; thereafter expanding and evaporating the liquefied working medium in an evaporator by the taking up of thermal energy from the environment; passing the evaporated working medium to an absorber for solution in the solvent while giving up thermal energy to the heat-transport medium; passing another part of the working medium-solvent solution from the generator to the absorber while pumping working medium-solvent solution from the absorber to the generator; and which comprises in said second mode indirectly heating by heat exchange all the heat-transport medium in a heat boiler separate from the generator; and which further comprises, in switching over from the first mode to the second mode, discontinuing the heating of the generator, discontinuing the pumping of the working medium-solvent solution between the absorber and the generator, and diverting all the heat-transport medium to and through the heat boiler for indirect heating by heat exchange therein; and which also comprises, in switching back from the second mode to the first mode, restarting the heating of the generator and the pumping of the working medium-solvent solution, and discontinuing passing the heat-transport medium through the heat boiler.

4,561,260

METHOD OF CONTROLLING REFRIGERATION SYSTEM FOR AUTOMOTIVE AIR CONDITIONER

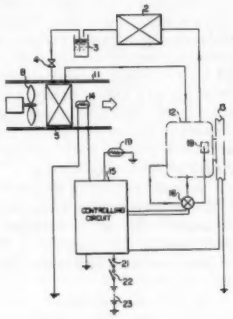
Yasuyuki Nishi, Oobu; Masashi Takagi, Kariya, and Masao Sakurai, Oobu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Division of Ser. No. 416,065, Sep. 8, 1982, Pat. No. 4,471,632. This application Aug. 6, 1984, Ser. No. 621,235

Claims priority, application Japan, Sep. 9, 1981, 56-142005; Oct. 5, 1981, 56-158364; Oct. 14, 1981, 56-163846; Dec. 7, 1981, 56-196649

Int. Cl.⁴ F25B *1/00*

U.S. Cl. 62—115 **5 Claims**



3. A method of controlling a refrigeration system for an automotive air conditioner, said system including a variable displacement refrigerant compressor adapted to be driven by an engine of the automobile and an evaporator, said method including:

detecting a condition related to the cooling operation of said evaporator to obtain a first signal;

detecting a temperature of an ambient air outside an occupant compartment of the automobile to obtain a second signal;

detecting the operation speed of said engine to obtain a third signal; and

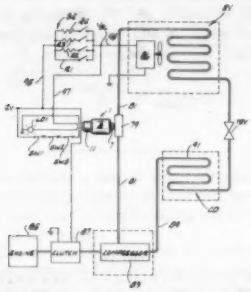
utilizing said first, second and third signals to control the compressor operation such that the displacement capacity of said compressor is varied stepwise and said compressor is operated intermettently.

4,561,261

CONTROL APPARATUS AND METHODS, HEAT TRANSFER SYSTEMS AND APPARATUS AND METHODS FOR CONTROLLING SUCH SYSTEMS AND FOR SENSING AND INDICATING LOW FLUID CHARGE CONDITIONS THEREIN

William P. Kornrumpf, Albany, and William J. Laughton, Schenectady, both of N.Y., assignors to General Electric Company, Fort Wayne, Ind.

Filed Apr. 4, 1984, Ser. No. 596,831
Int. Cl.⁴ F25B *1/00*; H01H *35/18*
U.S. Cl. 62—126 **60 Claims**



1. Apparatus for controlling the operation of an air conditioning system having a compressor, electrically energizable means for driving the compressor, a pressure line for conducting compressed refrigerant from the compressor, an evaporator, a blower operable at different blower speed selections for moving air over the evaporator thereby to cool the air, and a suction line for returning expanded refrigerant to the compressor, the apparatus comprising:

means for producing an electrical signal responsive to the pressure of the refrigerant in the suction line;

means for providing a selected one of a plurality of electrical reference signals corresponding to a selected low pressure level in response to a respective one of the blower speed selections, and for providing another electrical reference signal corresponding to a higher pressure level;

means for comparing the electrical signal representing the refrigerant pressure in the suction line to the higher pressure electrical reference signal and to the selected one low pressure electrical reference signal; and

means responsive to said comparing means for electrically energizing the compressor driving means when the refrigerant pressure exceeds the higher pressure level and for electrically deenergizing the compressor driving means when the refrigerant pressure falls below the selected low pressure level.

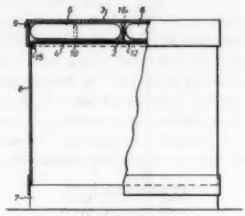
4,561,262

TOP STRUCTURE

Benny Fredrixon, Lidingö , Sweden, assignor to Ilsbo Industrier AB, Sweden

Continuation of Ser. No. 529,738, Sep. 6, 1983, abandoned. This application May 20, 1985, Ser. No. 735,729
Claims priority, application Sweden, Jul. 12, 1983, 8303938
Int. Cl.⁴ F25D *25/00*
U.S. Cl. 62—62 **16 Claims**

1. A method of cooling goods to be transported, comprising providing an open top transport compartment, placing goods to be cooled in said transport compartment, closing the open top of the transport compartment with a top structure having cavity means with unpressuirzed tank means therein connected to permanently open nozzle means by open pipe means and having a quick coupling with an automatic valve, filling said tank means via said quick coupling and automatic valve with an unpressurized liquid cooling medium, and causing said cooling medium to evaporate and to flow in a gaseous state



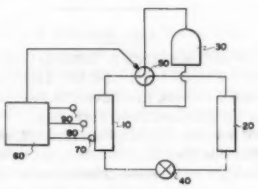
through said pipe means and downwardly through said nozzle means into said compartment.

4,561,263

REFRIGERATION OR HEAT PUMP SYSTEM DEFROST

Ulrich Bonne, Hopkins, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 479,419, Mar. 28, 1983, abandoned. This application Oct. 15, 1984, Ser. No. 660,663
Int. Cl.⁴ F25D *21/06*
U.S. Cl. 62—176.2 **6 Claims**



6. Apparatus for initiating the defrost cycles of an evaporator coil in a refrigeration or heat pump system, comprising:

means for monitoring the evaporator coil temperature;

means for monitoring a relative humidity in the evaporator coil environment;

means for monitoring an air temperature in the evaporator coil environment; and

means for initiating the defrost cycles of the evaporator coil at a frequency proportional to the difference between a water vapor pressure in air in the evaporator coil environment and a saturation water vapor pressure corresponding to the evaporator coil temperature.

4,561,264

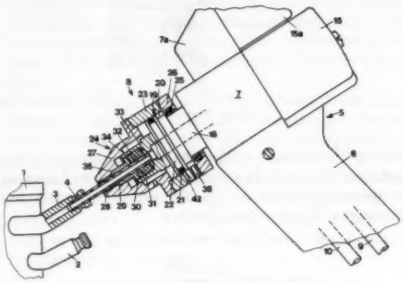
VALVE APPARATUS FOR EVACUATING AND/OR FILLING A REFRIGERATION SYSTEM

Gustav A. Johansson, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Oct. 17, 1984, Ser. No. 661,591
Claims priority, application Fed. Rep. of Germany, Oct. 20, 1983, 3338159
Int. Cl.⁴ F25B *45/00*
U.S. Cl. 62—292 **7 Claims**

1. A valve unit for evacuating or filling a refrigeration system having a connecting tube, comprising, a connecting head member forming a cylindrical chamber and a piston slidably disposed therein, sealing means for said piston forming an expansible pressure chamber on one side thereof, said piston having wall means forming a central chamber closed at one end thereof with an abutment face, a resilient annularly shaped sealing ring disposed in said central chamber so as to be closely confined by said wall means and in abutting engagement with said abutment face, a clampling sleeve axially aligned with said

sealing ring having one end thereof in abutting engagement with an interior surface of said connecting head and the other end thereof in effective abutting engagement with said sealing ring, said connecting head and said sealing ring and said sleeve forming central passage means for receiving a refrigeration system connecting tube, said connecting head having an inlet aperture having fluid communication with said expansible



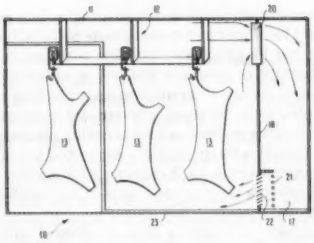
pressure chamber to effect movement of said piston to effect squeezing of said sealing ring between said piston and said clamping sleeve to effect a sealing engagement between said sealing ring and said connecting tube, said piston having evacuating and filling passage means having fluid communication with said central chamber for directing pressurized fluid to or evacuating fluid from said central chamber and a said connecting tube therein.

4,561,265

AIR CIRCULATION SYSTEM

Raymond S. Cardiff, Macgregor, Australia, assignor to Cardiff's Pty Ltd., Australia

Filed Feb. 3, 1984, Ser. No. 576,652
Int. Cl.[4] F25D *17/06*
U.S. Cl. 62—419 **6 Claims**



1. An air circulation system for circulating air in a chamber or room, the system including:

a plenum chamber extending along one wall of the room, said plenum chamber having an inlet aperture and a spaced outlet aperture;

a venturi defining an opening and located in said inlet aperture, said venturi including a rear cylindrical part within said plenum chamber and an outwardly flared bell mouthed part terminating in an outer edge;

a multi-bladed radial fan supported within the venturi for drawing air from the room into the plenum chamber, the leading edges of the blades of said fan being axially inwardly spaced from the outer edge of the venturi by a distance within 0.1 to 5 percent of the diameter of the venturi opening, the blades of the fan being at a pitch of between 10 to 60 degrees whereby rotation of the fan between 300 to 400 revolutions per minute causes air intake by the fan to be substantially radially of the venturi; and,

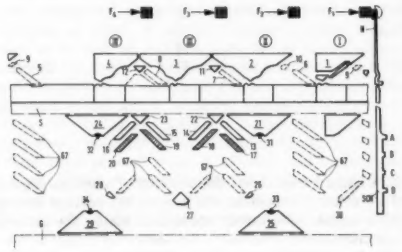
refrigerant coils for conveying refrigerant mounted inside said plenum chamber adjacent said outlet aperture whereby air drawn into said plenum chamber is forced across the coils and returns to said room through said outlet aperture.

4,561,266

METHOD FOR KNITTING STOCKINGS

Wolfgang Häcker, Altenstadt, Fed. Rep. of Germany, assignor to Fred Vatter Strumpffabriken Schongau-Altenstadt GmbH, Altenstadt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 251,138, Apr. 6, 1981, abandoned. This application Nov. 2, 1983, Ser. No. 548,087
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1980, 3022080; Jul. 28, 1980, 3028603; Jan. 28, 1981, 3102818
Int. Cl.[4] D04B *9/20*
U.S. Cl. 66—51 **1 Claim**



1. A method for knitting stockings on a circular knitting machine, said machine having a needle cylinder driveable either in a rotational or in a reciprocating mode, wherein a heel cup is formed in the reciprocating mode of strokes in opposing directions in which knitting is carried out with multiple feeds and with the needles being raised solely by means of jacks that are controlled by cams and picks, during the reciprocating mode a narrowing and a widening cycle being carried out during which groups of active and of lowered inactive needles are formed, during the narrowing cycle the leading jack of said active group being picked downwardly and then raised to a tuck position at the beginning of each narrowing stroke such that its associated needle tucks at the first feed active on said narrowing stroke while the following needles knit jersey stitches thereat, said leading jack being moved to its fully inactive position before the subsequent feed such that its associated needle welts at the subsequent feed with the remaining needles forming jersey stitches thereat, the jack following said leading jack being picked downwardly during the remainder of said narrowing stroke subsequent to the last feed active in said stroke, said jack following the leading jack being raised to a tuck position on the next narrowing stroke, such that its associated needle knits a tuck stitch at the first feed active on said next stroke, said following jack being moved to its fully inactive position subsequent to said first feed active on said next stroke, and during the widening cycle the leading jack of said inactive group being picked upwardly and then raised to a tuck position at the beginning of each widening stroke such that its associated needle tucks at the first feed active on said widening stroke while the following needles remain inactive thereat, said leading jack being moved to its fully active position before the subsequent feed such that its associated needle knits a jersey stitch thereat, the jack following said leading jack being picked upwardly during the remainder of said widening stroke subsequent to the last feed active in said stroke such that its associated needle knits a tuck stitch at the first feed active on the next widening stroke, said following jack being moved to

its fully operative position subsequent to said first feed active on the said next widening stroke.

4,561,267

KNITTED SOCK

Maxwell Wilkinson, Sandringham; Malcolm J. Patten, Ringwood, and Jeffrey H. Lee, Box Hill North, all of Australia, assignors to Dunlop Olympics Limited, Brunswick, Australia

Continuation-in-part of Ser. No. 904,380, May 10, 1978, and Ser. No. 38,887, Jul. 29, 1980. This application Jul. 30, 1980, Ser. No. 173,712

Claims priority, application Australia, May 10, 1977, PD0048/77

Int. Cl.[4] D04B *11/00*

U.S. Cl. 66—178 A **8 Claims**

1. A knitted man's sock that consists of a knitted leg portion and a knitted foot portion, the knitted leg portion having

(a) a length which does not extend above the knee of the wearer and

(b) a leg circumference that increases in an upward direction from a minimum circumference point which when the sock is in use is located below the calf of the wearer, the improvement comprising

(1) said knitted sock being of a fabric having less than 105 stitches per square centimeter when measured fully stretched in course and wale directions and at standard conditions for testing textiles,

(2) the fabric-to-leg pressure when the sock is in use progressively decreasing from a point of maximum pressure of 8–16 mm of mercury located on the minimum leg circumference portion of the sock to a point of minimum pressure located adjacent the top marginal portion of the sock, said progressive decrease of pressure being such that the fabric-to-leg pressure at the mid-calf is less than 60% of that at the minimum leg circumference portion and not less than about 2 mm of mercury.

4,561,268

WALL ADAPTER FOR TILT TYPE WASHER-EXTRACTOR MACHINE

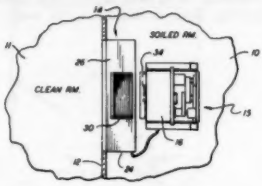
Theron E. Southwick, Cazenovia, and John W. Mitchell, Marcellus, both of N.Y., assignors to G. A. Braun Inc., Syracuse, N.Y.

Filed Jul. 2, 1984, Ser. No. 626,882

Int. Cl.[4] D06F *39/00*

U.S. Cl. 68—210 **9 Claims**

1. For use with an industrial washer-extractor machine of the tilt type; the machine having but a single access door and being movable between a rearwardly tilted position for loading, a horizontal operating position, and a forwardly tilted position for unloading; an adapter for permitting clean room use of said tilt type machine, the adapter being arranged to be incorporated in a wall separating a soiled room and a clean room, the adapter projecting into the soiled room and including an obliquely disposed wall having an opening therein, a normally closed door for the opening, the last-named door being mounted on the obliquely disposed adapter wall, the tilt type machine being positioned in the soiled room and being engageable with the obliquely disposed adapter wall when the machine is moved into its forwardly tilted position, the machine engaging the wall in the area surrounding its opening, the wall opening being opposite the access door of the machine



and being dimensioned so that the access door can be opened thru it after the normally closed door for the wall opening has been opened, whereby the machine can be unloaded thru the wall opening into the clean room.

4,561,269

KEY-EXCHANGEABLE LOCK

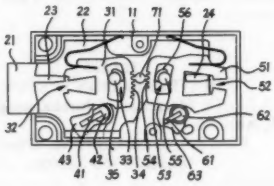
Minoru Tanaka, Hiroshima, Japan, assignor to Kabushiki Kaisha Kumahira Seisakusho, Hiroshima, Japan

Filed May 25, 1984, Ser. No. 614,189

Claims priority, application Japan, Jun. 8, 1983, 58-100881

Int. Cl.[4] E05B *35/12*

U.S. Cl. 70—339 **8 Claims**



1. A key-exchangeable lock including a lock housing, and within said lock housing a running plate provided with a fence, a locking bar longitudinally movable with said running plate and a plurality of tumblers adapted to cooperate with said fence so as to allow, in a predetermined unlocking position, the running plate to be retracted, wherein said tumblers are moved to said unlocking position and said running plate is retracted to its unlock position by rotation of a prescribed key; and wherein said prescribed key is exchangeable with another prescribed key by displacing the rotational axes of said tumblers, characterized in that

said tumblers and running plate are formed with openings;

a conversion shaft rotatably supported in the lock housing extends through said openings formed in said tumblers and running plate;

said conversion shaft is provided with an eccentric portion adapted to be pressed against an end surface of said opening formed in said tumblers to fix the rotational axes of said tumblers when said conversion shaft occupies a predetermined fixed position but to release said rotational axes of the tumblers when said conversion shaft occupies a predetermined conversion position, a stop piece adapted to cooperate with said opening of the running plate so as alternatively to block and to allow rotation of said conversion shaft and a locking piece adapted to cooperate with said opening of the running plate so as alternatively to block and to allow displacement of said running plate and rotation of said conversion shaft;

said stop piece engages one edge of the opening formed in said running plate to hold said conversion shaft at its fixed

position when the running plate occupies its lock position and said stop piece is disengaged from said opening of the running plate to allow rotation of the conversion shaft when the running plate occupies its unlocking position;

said locking piece is engaged with one edge of the opening formed in the running plate to lock retreat of said running plate at a predetermined unlock position when the conversion shaft occupies its fixed position and said locking piece is disengaged from said one edge of the opening formed in the running plate to allow retreat of said running plate from said unlocking position to its conversion position when said conversion shaft occupies its conversion position;

said locking piece is engaged with one edge of the opening formed in said running plate to hold said conversion shaft at its conversion position when said running plate occupies its conversion position; and

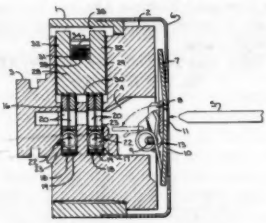
advancement of said running plate from its position for conversion is blocked by engagement of said locking piece with said one edge of the opening formed in the running plate as said prescribed key has moved said tumblers to their unlocking positions.

4,561,270

KEY OPERATED SHALLOW PENETRATION LOCK

Robert R. Spreng, Brookfield, Wis., assignor to Briggs & Stratton Corp., Wauwatosa, Wis.

Filed Dec. 7, 1983, Ser. No. 558,917
Int. Cl.⁴ E05B *15/14*
U.S. Cl. 70—364 R **9 Claims**



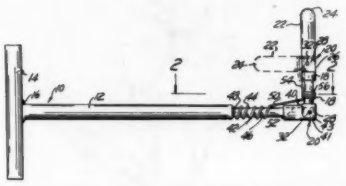
1. A key operated lock, comprising an outer casing, a cylinder mounted for rotation within the outer casing and adapted to be connected to a working member, said cylinder including a central keyway, locking means for releasably locking the cylinder with respect to the casing, said cylinder having a guideway intersecting said keyway, a pair of tumblers disposed in side-by-side sliding movement within said guideway, each tumbler having an aperture aligned with said keyway, said tumblers having aligned openings separate from said apertures, biasing means disposed within the aligned openings with the force of said biasing means acting in a direction parallel to said guideway, said biasing means comprising a compression spring seated between the ends of the respective openings, the axis of said spring being parallel to said guideway, a pair of shoulders formed on said cylinder adjacent said guidways, one end of said spring engaged with one of said shoulders and the opposite end of said spring engaged with the other of said shoulders, a key to be received within the keyway and in said apertures, said key having at least one bit on opposite edges with said bits moving the tumblers relative to each other as the key is inserted within the keyway to thereby move said tumblers to an operative position, and means responsive to said tumblers being in said operative position for releasing said locking means whereby said cylinder can be rotated relative to said casing, engagement of said spring with said shoulder maintaining said tumblers in a neutral position when the key is withdrawn from said keyway.

4,561,271

LOCK BYPASSING TOOL

Gerald L. Scharboneau, Trenton, Mich., assignor to Jack Van Wallaghen, Trenton, Mich., a part interest

Filed Dec. 19, 1983, Ser. No. 562,422
Int. Cl.⁴ E05B *19/12*
U.S. Cl. 70—399 **19 Claims**



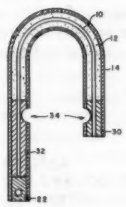
1. A tool for operating the bolt mechanism of a cylinder type lock, said lock being provided with a plug having a key slot, said tool comprising an elongated relatively slender metallic rod forming a shank, a jointed knuckle portion hingedly mounted at an end of said shank by hinge means allowing approximate 90° pivoting of said jointed knuckle portion from a position aligned with said shank to a position substantially at a right angle to said shank, abutment means preventing pivoting of said jointed knuckle portion in an opposite direction, and biasing means constantly urging said jointed knuckle portion to said right angle pivoted position wherein said biasing means comprises a spring wire having an end attached to said shank and a coil portion disposed around said shank provided with another end attached to said jointed knuckle portion, said other end of said spring wire attached to said jointed knuckle portion comprising a coil portion disposed around said jointed knuckle portion and an integral straight portion disposed between said coil portions.

4,561,272

PADLOCK SHACKLE

David Goldstein, Adelphi, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 5, 1984, Ser. No. 627,936
Int. Cl.⁴ E05B *15/16*; B32B *15/04*
U.S. Cl. 70—417 **4 Claims**



1. A padlock shackle comprising:

(1) an inner core of ductile nickel-titanium alloy comprising from 53 to 62 weight percent of nickel with the remainder being essentially titanium;

(2) an outer casing of hardened stainless steel; and

(3) an intermediate layer of a composite of from 20 to 23 volume percent of tungsten carbide particles from more than 0.6 mm to less than 2.0 mm in size with the remainder of the composite being essentially a matrix of nickel-titanium alloy comprising from 53 to 62 weight percent of nickel with the remainder of the alloy being titanium;

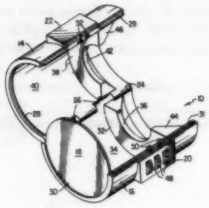
the intermediate composite binding the stainless steel casing to the nickel-titanium core rod.

4,561,273

DOORKNOB SECURITY APPARATUS

Forrest J. Robinson, P.O. Box 697, Mt. Vernon, Tex. 75457

Filed May 21, 1984, Ser. No. 612,451
Int. Cl.⁴ E05B *17/14*
U.S. Cl. 70—426 **12 Claims**



1. A security apparatus for inhibiting key access to a doorknob having a gripping portion with an integral lock and a stem portion, comprising:

a first semi-cylindrical member;

a second semi-cylindrical member, said first and second semi-cylindrical members cooperating to form a hollow right circular cylinder for disposal about the doorknob;

locking means for locking said first and second semi-cylindrical members together about the doorknob;

a disk shaped member dimensioned to cover the open end of said formed right circular cylinder;

a first arcuate grove disposed along the periphery of said first semi-cylindrical member and directed radially inward, said first groove for receiving one-half of the periphery of said disk shaped member;

a second groove disposed on periphery of said second semi-cylindrical member and directed radially inward, said second groove for receiving the periphery of the remaining half of said disk shaped member;

said first and second grooves securing said disk shaped member to the periphery of said formed right circular cylinder until said first and second semi-cylindrical members are separated;

said disk shaped member providing a sealed surface over the integral lock to prevent access thereto; and

restricting means attached to the interior of said formed right circular cylinder about the stem of the doorknob for preventing removal of said formed right circular cylinder, removal of the security apparatus facilitated only by the separation of said first and second semi-cylindrical members.

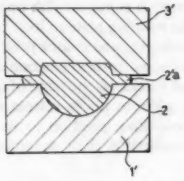
4,561,274

METHOD OF AND APPARATUS FOR FORGING HOLLOW BLANK MEMBER

Kazuhisa Kumekawa, Tsurugashima, and Shinichi Ando, Higashimatsuyama, both of Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Nov. 9, 1984, Ser. No. 670,178
Claims priority, application Japan, Nov. 16, 1983, 58-215524
Int. Cl.⁴ B21D *19/00*
U.S. Cl. 72—54 **7 Claims**

1. A method for forging a hollow blank member comprising the steps of filling the hollow interior of a hollow blank member with a liquid pressure medium and enclosing the latter in sealed condition therein, applying an external pressure to the hollow blank member when the latter is filled with the pressure medium, allowing part of the pressure medium to be discharged gradually so as to maintain the pressure of the pressure medium as an internal pressure which opposes the external pressure, and applying a desired plastic deformation to the



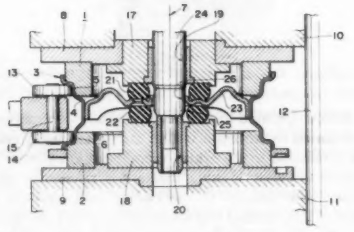
hollow blank member while the pressure medium is being discharged.

4,561,275

METHOD OF SHAPING AND MACHINING DISC WHEEL AND EQUIPMENT THEREFOR

Susumu Itou, Kawasaki; Kishirou Abe, and Morishi Kunou, both of Ayase, all of Japan, assignors to Tomy Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 24, 1983, Ser. No. 497,428
Int. Cl.⁴ B21D *53/26*
U.S. Cl. 72—70 **16 Claims**



1. A method of shaping and machining a disc wheel comprising the steps of:

resiliently holding a disc wheel formed by welding together a rim and a disc between an upper mandrel and a lower mandrel so that said upper and lower mandrels are inscribed with rim bead seat portions formed on both sides of said rim, said upper and lower mandrels having a common axis;

pressing an upper spinning roll against only the outer periphery of said rim bead seat portion on one side of said rim and pressing a lower spinning roll against only the outer periphery of said rim bead seat portion on the other side of said rim while allowing said disc wheel to rotate with rotation of said upper and lower mandrels to effect shaping of said rim bead seat portions by spinning; and

inserting a cutter into a hub hole formed in said disc and machining said hub hole with said cutter, said cutter having the same axis as said common axis of said upper and lower mandrels.

4,561,276
METHOD OF DEEP-ROLLING CRANKSHAFTS

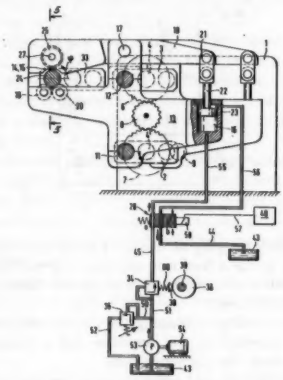
Garri Berstein, Erkelenz, Fed. Rep. of Germany, assignor to Wilhelm Hegenscheidt Gesellschaft mbH, Erkelenz, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 305,119, Sep. 24, 1981, abandoned. This application Jan. 9, 1984, Ser. No. 568,893

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1980, 3037688

Int. Cl.⁴ B21H *7/00*

U.S. Cl. 72—81 **6 Claims**



1. The method of deep rolling the fillets of a workpiece having bearing pins parallel to the axis of rotation, said bearing pins being bounded at at least one end by a lateral surface, each of said fillets forming a transition radius between the said lateral surface and the surface of a related bearing pin, comprising the steps of rotating said workpiece about its axis while simultaneously continuously applying to the said fillets a rolling force of varying magnitude, the magnitude of said rolling force being maintained at a value to cause said lateral surfaces of said bearing pins to assume a constant angle of enlargement relative to the axis of said pins throughout an entire rotation of said workpiece, said rolling force being at least of the magnitude necessary to produce a desired fatigue strength increase in selected arcuate areas of said workpiece.

4,561,277
METHOD OF MAKING SCREWS AND DIES THEREFOR

Hubert Taubert, and Rudolf Webendoerfer, both of Neuwied, Fed. Rep. of Germany, assignors to Conti Fasteners AG, Zug, Switzerland

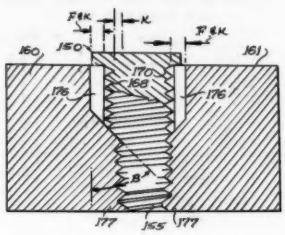
Filed Aug. 29, 1984, Ser. No. 646,255

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1983, 3332570

Int. Cl.⁴ B21H *3/04;* **B21D** *17/00*

U.S. Cl. 72—88 **9 Claims**

1. A method of making screws of a type having a portion of its length of circular cross section and an adjacent portion of its length of lobular cross section, comprising providing a screw blank with a circular cross section over a portion of its length and an adjacent portion of its length with a lobular cross section of the type having circumferentially spaced lobes separated by intermediate arcuate sides of larger radius than the radius of the lobes, rolling the blank between thread rolling dies so as to roll a thread on the blank portion with circular cross section and simultaneously roll on the lobular sections a thread that is less developed than the thread on said length of circular cross section but with the thread at the lobes being regions where the thread on the lobular section has its maximum development, thereafter rolling the thread on the lobular



section to a further development while passing said length of circular cross section into regions of relief on said dies.

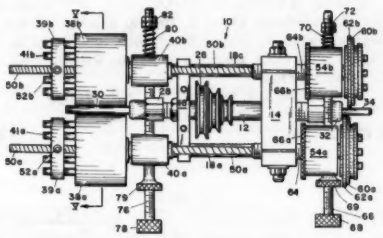
4,561,278
COILING MACHINE

Stephen A. Platt, Grand Haven, Mich., assignor to S. A. Platt, Inc., Grand Haven, Mich.

Filed Sep. 20, 1984, Ser. No. 652,509

Int. Cl.⁴ B21F *3/02, 3/04*

U.S. Cl. 72—142 **5 Claims**



1. A wire coiling apparatus comprising:

a rotational arbor shaft with a forming arbor at the front end and a drive arbor at the rear;

a rear drive rolls astraddle said drive arbor and having a frictional peripheral surface material in engagement with said drive arbor;

front forming rolls astraddle said forming arbor, having coil-forming peripheral surfaces for engagement with a wire coil being formed around said forming arbor;

the diameter of said drive rolls being essentially the same as the diameter of said forming rolls, and flexible drive cable shafts between respective of said drive rolls and forming rolls, to cause a one-to-one drive therebetween while accommodating slight diametral variations by minor lateral movement of said forming rolls.

4,561,279
ROD BENDING AND CUTTING APPARATUS

Leonard Wears, 6775 32nd St. N., St. Petersburg, Fla. 33702

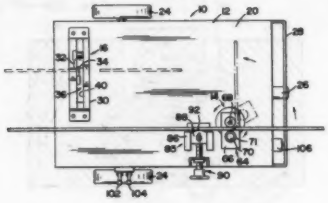
Filed Aug. 24, 1984, Ser. No. 643,692

Int. Cl.⁴ B21D *7/02*

U.S. Cl. 72—218 **8 Claims**

1. Rod cutting and bending apparatus comprising a workbench, a cutting assembly mounted on the top of the workbench, a bending assembly mounted on the top of the workbench, said cutting assembly having a movable cutter, said bending assembly having a rotatable member, means for actu-

ating said movable cutter and rotatable member, a power package mounted on said workbench for operating said actuating means, and means for controlling the power flow from said power package to said actuating means.



4,561,280

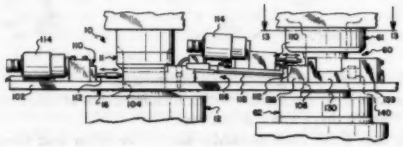
SHELL MAKING METHOD AND APPARATUS

Henry C. Bachmann; Omar L. Brown; Ermal C. Fraze, all of Dayton; James R. Gregg, Springboro, and David K. Wynn, Dayton, all of Ohio, assignors to Dayton Reliable Tool & Mfg. Co., Dayton, Ohio

Filed Jan. 16, 1984, Ser. No. 571,050

Int. Cl.⁴ B21D *45/00*

U.S. Cl. 72—346 **25 Claims**



1. A method of forming shells such as used in the manufacture of can ends, comprising the steps of:

at a first station separating a generally circular blank from a sheet of thin metal and forming into said blank a substantially flat central panel and an upward-extending chuckwall about the edge of said panel to produce a partially formed shell, the junction of said chuckwall with said panel defining a relatively large radius of curvature;

transferring said partially formed shell from said first station along a predetermined first path to a second station by striking a blow edgewise of said shell and thereby directing said shell edgewise to said second station;

capturing and locating said shell at said second station;

at said second station forming into said shell a countersink at the base of said chuckwall by gripping said chuckwall while moving said panel upward relative to said chuckwall to produce a completed shell; and

discharging said shell from said second station along a second path;

the forming steps occurring essentially simultaneously at said first and second stations upon successively separated blanks.

4,561,281

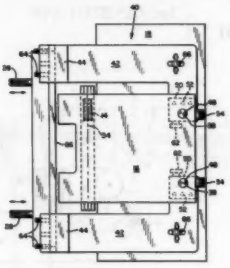
AUXILIARY GAUGING DEVICE

Ry M. Tran, Portland; Floyd E. Stevens, Beaverton; Donald L. Turk, Tigard, and Kwang S. Chun, Beaverton, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Jan. 23, 1984, Ser. No. 572,788

Int. Cl.⁴ B21D *11/22*

U.S. Cl. 72—389 **4 Claims**



1. An auxiliary gauging device for a press brake designed to automatically locate a backstop relative to a bending tool for bending a work piece supported on a support table, said gauging device comprising

a locater bar having a clamping yoke at one end and a locating pin disposed at the opposite end a predetermined distance from the clamping yoke,

clamping means on said yoke for securing the gauging device to the backstop of the press brake to position the locating pin a known distance from the backstop, said clamping means enabling adjustment of the backstop to locate the locating pin a desired distance from the bending tool,

means for movably supporting said opposite end of the bar on the support table of the press brake,

said locater bar being configured to define a work piece support area between the locating pin and the backstop, and to position the pin on one side of the work piece for projection through the work piece as permitted by a locating hole in the work piece.

4,561,282

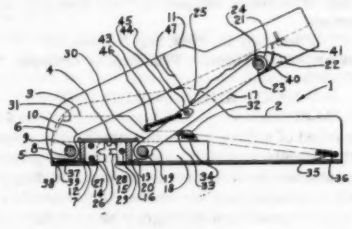
DIMINISHING ARM TOGGLE LINKAGE

Edward L. Hadden, Sr., 110 E. Maplewood Ave., Mechanicsburg, Pa. 17055

Filed Sep. 28, 1984, Ser. No. 655,562

Int. Cl.⁴ B21D *9/08*; B25B *7/12*

U.S. Cl. 72—410 **12 Claims**



1. A diminishing arm toggle linkage tool comprising:

(a) an elongated chassis member;

(b) first and second elongated force applying members having their longitudinal axes aligned, said force applying members each having an inner and an outer end, said inner ends being adjacent to each other on the axial line, said

force applying members being mounted on said chassis member for axial movement toward and away from each other between a closed abutting position and an open spaced apart position to thereby define a work space between said inner ends which diminishes axially when said force applying members are moved toward each other;

(c) a third elongated member attached for pivotal motion at its one end to a point on said second force applying member spaced from said inner end thereof;

(d) a fourth elongated member attached for pivotal motion at its one end to a point near said outer end of said first force applying member;

(e) the other end of said third member being attached for pivotal motion to said fourth member at a point spaced from said one end of said fourth member;

(f) the distance between attachment points on said third and fourth members respectively defining first and second toggle arms;

(g) the distance between the attachment point on said first force applying member and the attachment point on said second force applying member defining a third toggle arm, the length of which varies by the distance from open to closed positions of said first and second force applying members; and

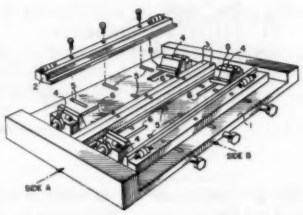
(h) the length of said second toggle arm being substantially equal to the length of said first toggle arm plus the length of said third toggle arm in said closed position.

4,561,283

OFF-SET BOTTOM BAKERY PAN RENOVATION PROCESS

William L. Gaddy, 300 Woodhollow Ct., Wylie, Tex. 75098

Filed Sep. 6, 1983, Ser. No. 529,608
Int. Cl.⁴ B21D *17/02*
U.S. Cl. 72—414 **1 Claim**



1. A method of reforming baking pans which comprises:

(a) using a press containing a relatively movable top male reforming die;

(b) lowering said die into the cavity of a workpiece to be reformed, said workpiece initially resting on movable upraised guide rails;

(c) a bottom receiving female die aligned underneath the male die;

(d) applying necessary pressure from the press to force the male die completely onto the female cavity;

(e) the movable guide rails reach their lower limit when they contact the female die's bottom surface whereby the movable guide rails become part of the female die's forming surface;

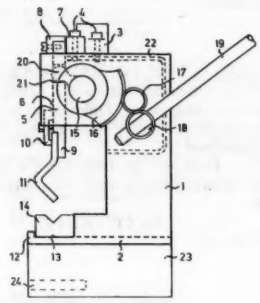
(f) the necessary force is applied to the male die from the press to form an off-set bottom in the workpiece.

4,561,284

SHEET METAL WORKING DEVICE

Heinz Kisslig, Hauptstrasse 70, CH-8552 Felben, Switzerland

Filed Apr. 27, 1984, Ser. No. 604,893
Int. Cl.⁴ B21C *3/02*
U.S. Cl. 72—464 **6 Claims**



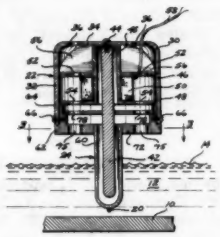
1. Sheet metal working device comprising two C-shaped side panels (1) having guide slots (6) on their inside opposing surfaces and connected to each other by at least one crossbar (3), a movable carrier (5) extending between said side panels and reciprocably movable in said guide slots (6) by mechanical drive means operated by hand lever (19), characterized by said carrier being provided on its top portion with a sharpened inverted L-profile bar (8) serving as a movable blade cooperating with a stationary crossbar (7) retained by said crossbar (3) to function as sheet metal shears when said carrier (5) is moved upwardly, and said carrier being provided on its lower portion (9) with a holding means (10) to hold a top sheet metal working tool (11) cooperating with a stationary bottom tool (14) when said carrier (5) is moved downwardly.

4,561,285

THERMALLY ISOLATED CALIBRATION APPARATUS

Craig E. Nelson, and Marvin L. Strenge, both of Seattle, Wash., assignors to TAB Leasing, Seattle, Wash.

Filed Sep. 14, 1984, Ser. No. 650,805
Int. Cl.⁴ G01H *25/00*
U.S. Cl. 73—1 B **6 Claims**



1. An apparatus for calibrating a force measuring instrument that includes a force sensitive element submerged in a liquid, the apparatus comprising:

a magnetic object having a known weight when submerged in the liquid; and

an electromagnet comprising a core of magnetic material that includes a first end extending beneath the surface of the liquid to a position adjacent the upper surface of the force sensitive element, a coil surrounding a portion of the core, for energizing and deenergizing the coil, and a thermal insulator surrounding the first end of the core such

that the core does not contact the liquid and such that flow of heat from the first end into the liquid is limited, the strength and position of the electromagnet being such that when the coil is energized, the magnetic object is picked up from the force sensitive element and adheres to the insulator, and such that when the electromagnet is deenergized, the magnetic object falls back onto the force sensitive element.

4,561,286

PIEZOELECTRIC CONTAMINATION DETECTOR

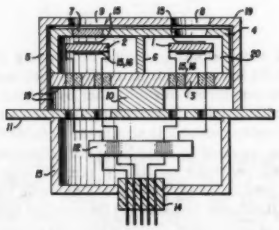
Jörg Sekler, Neuchatel; Alphonse E. Zumsteg, Solothurn, and Hans Erich Hintermann, Fluhweg, all of Switzerland, assignors to Laboratoire Suisse de recherches Horlogeres, Neuchatel, Switzerland

Filed Jun. 28, 1984, Ser. No. 625,550

Claims priority, application Switzerland, Jul. 13, 1983, 3826/83

Int. Cl.⁴ G01N *27/12*

U.S. Cl. 73—23 **20 Claims**



1. A piezoelectric contamination detector comprising:
a piezoelectric mesuring resonator having at least one thin-film temperature sensor integrated therewith;
a reference resonator;
a cooling/heting chamber housing said resonators;
a contamination shield separating said reference resonator from said measuring resonator;
an optical window in a wall of said cooling/heating chamber protecting said reference resonator from external contamination, said optical window being substantially transparent to heat radiation; and
a detector housing enclosing said cooling/heating chamber;
wherein exterior surfaces of the cooling/heating chamber and interior surfaces of the detector housing are at least partially treated with a thermal control coating having low thermo-optical emissivity but high reflectivity, thereby minimizing heat loss between the cooling/heating chamber and the detector housing.

4,561,287

OXYGEN CONCENTRATOR

Robert O. Rowland, Hemet, Calif., assignor to Hudson Oxygen Therapy Sales Company, Temecula, Calif.

Continuation-in-part of Ser. No. 396,705, Jul. 9, 1982, Pat. No. 4,516,424. This application Jul. 26, 1984, Ser. No. 634,595

Int. Cl.⁴ G01N *31/06*

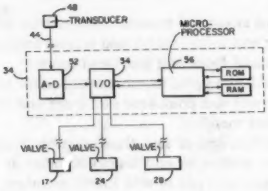
U.S. Cl. 73—23 **22 Claims**

1. In an oxygen concentrator comprising a plurality of molecular sieve beds for alternately receiving atmospheric air and for selectively adsorbing nitrogen therefrom to increase the oxygen concentration of a product gas recovered therefrom, a reservoir for receiving said product gas from said sieve beds, a compressor and a valve cooperating therewith for charging said sieve beds with atmospheric air, valve switching means for alternately charging said sieve beds, and means for withdrawing said product gas from said reservoir, the improvement comprising:

timing means for switching said valve according to a timing cycle,

means for sensing the rate of withdrawal of product gas from said reservoir, and

a microprocessor having memory means provided with the



minimum time required for charging said sieve beds to produce product gas of a selected oxygen concentration at the sensed rate of product gas withdrawal from said reservoir, and means for adjusting the timing cycle for switching said valve to charge said sieve beds for said minimum time.

4,561,288

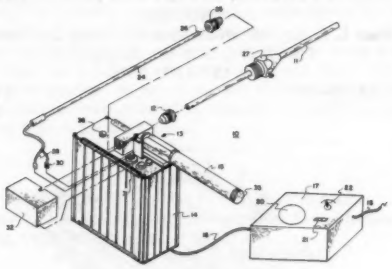
FLUE GAS ANALYZER WITH CARBON MONOXIDE DETECTOR

Patrick R. Moenkhaus, Moundsview, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 10, 1984, Ser. No. 608,758

Int. Cl.⁴ G01N *31/00*

U.S. Cl. 73—23 **11 Claims**



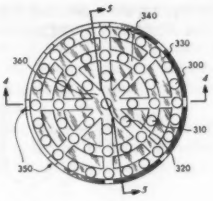
1. A flue gas analyzer device, including: a probe adapted to be inserted in a flue gas stack to withdraw a flue gas sample for analysis; flue gas analyzer means including an analyzer portion; said analyzer means having probe housing means and console means electrically connected to form said analyzer means; said housing means including fitting means for attachment of said probe to said housing means; said housing means including pump means to draw said flue gas through said probe, said fitting means, and said analyzer portion of said flue gas analyzer means; said flue gas analyzer means also including timer means connected to said pump means to time the operation of said pump means to draw a predetermined volume of flue gas from said stack through said probe and said fitting means; and said fitting means including carbon monoxide gas analyzer cell means said pump means being in flow communication with said flue gas analyzer means so as to provide a predetermined flow of said flue gas through said carbon monoxide gas analyzer cell means at a constant rate to accurately determine the carbon monoxide content of said flue gas.

4,561,289

PERFORATED END PLUG PLATE FOR TESTING CORE SAMPLES

Stanley C. Jones, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Sep. 14, 1984, Ser. No. 651,561
Int. Cl.[4] G01N *15/08*
U.S. Cl. 73—38 **6 Claims**



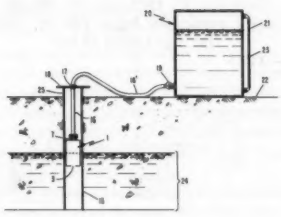
1. An improved perforated end plug circular plate having one surface abutting at least one end of a core sample during testing of the core sample, said perforated end plug plate being in fluid communication with a fluid for delivering said fluid into said at least one end, said improved end plug plate comprising said circular plate having at least one circular channel (330, 340) formed on the surface (380) opposing said abutting surface (370) located between the center and outer circumference of said plate; a plurality of radial channels formed on said opposing surface (380), in fluid communication with said at least one circular channel (330, 340), and emanating from a formed circular cavity (360) located in the center of said plate outwardly to said circumference; and at least one circular array (300, 310, 320) of holes formed in said abutting surface (370) and located in said at least one circular channel (330, 340) and said plurality of radial channels (380), so that said cavity (360) is in fluid communication with said fluid for extending said fluid through said radial channels into said at least one circular channel (330, 340), through said at least one circular array of holes (300, 310, 320) and into said core sample.

4,561,290

FLOAT VALVE APPARATUS FOR SOIL PERCOLATION MEASUREMENTS

Daniel E. Jewell, c/o Bureau of Reclamation, Department of the Interior, 2800 Cottage Way, Sacramento, Calif. 95825

Filed Nov. 29, 1984, Ser. No. 676,375
Int. Cl.[4] G01N *15/00*
U.S. Cl. 73—38 **11 Claims**



1. An apparatus for measuring the rate of water percolation through soil, comprising:

a supply of water;

means for measuring the rate of flow of water drawn from said supply;

means cooperating with said water supply for conveying said measurable flow of water to a test bore drilled into said soil at a test site to a selected depth;

means cooperating with said conveying means for regulating said measurable flow of water into said bore, said regulating means acting in response to the level of water contained in said bore; and

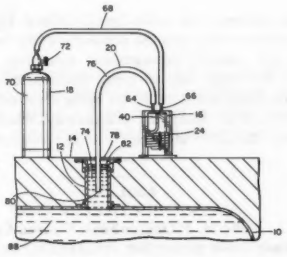
means cooperating with said conveying means for determining the location of said level of water contained in said bore with respect to a fixed reference.

4,561,291

LEAK DETECTOR FOR UNDERGROUND STORAGE TANKS

John A. Ainlay, 3330 Grant St., Evanston, Ill. 60201

Continuation-in-part of Ser. No. 458,349, Jan. 17, 1984, Pat. No. 4,474,054. This application Aug. 10, 1984, Ser. No. 639,686
The portion of the term of this patent subsequent to Oct. 2, 2001, has been disclaimed.
Int. Cl.[4] G01M *3/30*
U.S. Cl. 73—49.2 **6 Claims**



1. A portable, self-contained apparatus for detecting small leaks in a relatively large fluid storage tank having a fill-pipe, said apparatus comprising:

(A) a substantially air-tight chamber having an outer surface and having a measuring liquid therein;

(B) a slope tube communicating said measuring liquid to the atmosphere, at least a portion of said slope tube extending along the outer surface of said chamber;

(C) means for supplying gas to said chamber;

(D) tube means for communicating gas between said chamber and the fill-pipe of said fluid storage tank;

whereby when gas is introduced into the chamber it pressurizes the chamber above atmospheric pressure causing; (i) gas to bubble out of the tube means into said fill pipe and (ii) measuring fluid in the chamber to be displaced into the slope tube, the amount of fluid so displaced being a function of the depth of the tube means in the liquid in said fill pipe, tank leakage being detectable by observation of changes in the fluid level in said slope tube.

4,561,292

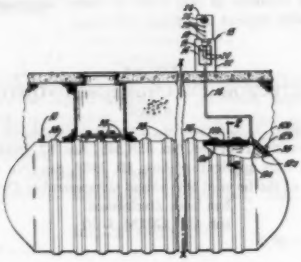
DOUBLE-WALL UNDERGROUND CONTAINER FOR STORING LIQUIDS AND LEAK DETECTING MEANS THEREFOR

Peter J. Pugnale, The Woodlands; John M. Clark, and William R. Penland, both of Conroe, all of Tex., assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 572,034, Jan. 19, 1984, abandoned. This application Jun. 3, 1985, Ser. No. 740,705
Int. Cl.[4] G01M *3/04*
U.S. Cl. 73—49.2 **9 Claims**

1. A double-wall underground container for storing liquids, comprising a generally cylindrical reinforced plastic inner tank, a generally cylindrical reinforced plastic outer tank larger than and surrounding the inner tank in spaced relationship thereto, each of said tanks having a generally cylindrical

wall portion and a pair of opposed end cap portions, a plurality of reinforced plastic annular connecting ribs spaced from each other axially of the tanks and connecting the cylindrical wall portions of the tanks to each other, annular chambers between the tanks being defined by the cylindrical wall portions of the tanks and pairs of adjacent connecting ribs, two opposed end



chambers between the tanks being defined by the end cap portions of the tanks, and the connecting ribs having two sets of generally aligned passageways extending therethrough axially of the tanks, one set being disposed essentially at the tops of the tanks and another set being disposed essentially at the bottoms of the tanks, the passageways interconnecting all the annular chambers and the two end chambers.

4,561,293

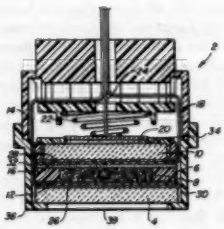
MATRIC SUCTION SENSOR

Lorenzo A. Richards, P.O. Box 3852, Carmel, Calif. 93921

Continuation-in-part of Ser. No. 310,295, Oct. 9, 1981, abandoned. This application Sep. 26, 1983, Ser. No. 535,754

Int. Cl.[4] G01N *13/00*

U.S. Cl. 73—73 **5 Claims**



1. An apparatus for measuring the matric suction of soil free from adverse effects due to changes in the salinity and temperature of the soil comprising:

a case having an opening therein for the passage of moisture to and from the soil and interior of the case;

first and second water-sensitive resistors characterized as being porous, compact bodies wettable by water found in the surrounding soil, said first water-sensitive resistor located relatively closer to said openings as compared to said second resistor and having a relatively coarse pore size distribution as compared to the second resistor;

circuit means electrically connected to said resistors for measuring the ratio of resistance of said resistors as affected by matrix suction, said circuit means including electrodes proximate opposite sides of each resistor; and

separate layers located between said water-sensitive resistors and at least all of said electrodes but the electrode located on said second resistor on its surface located furthest from said opening, said separate layers comprising substantially chemically inert, electrically conductive finely divided particles, which are wettable by an aqueous solution.

4,561,294

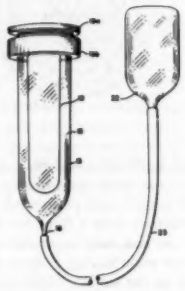
METHOD AND APPARATUS TO CONTROL SOIL MOISTURE MATRIC POTENTIAL

Henry T. Wilkinson, Champaign, Ill., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Sep. 14, 1984, Ser. No. 650,737

Int. Cl.[4] G01N *19/10, 33/24*

U.S. Cl. 73—73 **11 Claims**



1. A device for controlling the matric potential of a liquid in a porous sample, comprising:

(a) a porous cup having an opening at the top and a closed bottom, the height of the cup being greater than the radius, wherein said cup is penetrable by said liquid and has an air entry value exceeding a predetermined matric potential to be imparted to said sample;

(b) an outer vesicle having a rim at the top defining an opening and having an inlet at the bottom, wherein said vesicle is adapted to securely receive said cup so as to define a chamber between said cup and said vesicle, said chamber being isolated from the opening of the cup; and

(c) means communicating with said inlet for filling said chamber with liquid and for adjusting the pressure of the liquid in said chamber.

4,561,295

ENGINE THROTTLE VALVE POSITION DETECTING SYSTEM

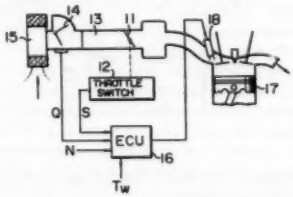
Kenichiro Kamai, Toyoake, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Feb. 25, 1985, Ser. No. 705,304

Claims priority, application Japan, Feb. 29, 1984, 59-39163

Int. Cl.[4] G01M *15/00*

U.S. Cl. 73—117.3 **6 Claims**



1. An engine throttle valve position detecting system including:

a throttle switch including a rotary detector member

adapted to be rotated in accordance with the rotation of an engine throttle valve and having a guide portion extending substantially in the direction of rotation of said rotary detector member and having a section offset radially relative to the direction of rotation of said rotary detector member, a movable contact adapted to be guided by said guide portion and movable in the radial direction of said rotary detector member when the latter is rotated and a stationary contact disposed in opposed relationship to said movable contact, said stationary and movable contacts having opened and closed positions which are changed over at two different predetermined rotational positions of said rotary detector member;

means producing a signal related to the engine operating condition; and

means for judging the position of said throttle valve based on one of the positions of said movable and stationary contacts and on said engine operating condition signal.

4,561,296

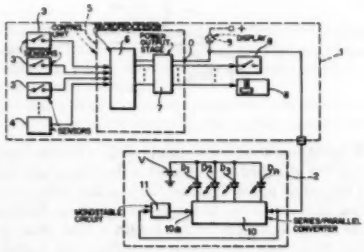
DIAGNOSTIC DEVICE FOR A SYSTEM FOR CONTROLLING THE STOPPING AND RESTARTING OF A INTERNAL COMBUSTION ENGINE FOR MOTOR VEHICLES

Renato Guagliumi, Turin, and Oscar Blazic, S.Ambrogio, both of Italy, assignors to Marelli Autronica S.p.A., Pavia, Italy

Filed Oct. 17, 1984, Ser. No. 661,728

Int. Cl.⁴ G01M *15/00*

U.S. Cl. 73—118 **6 Claims**



1. A diagnostic device for a system for controlling the stopping and restarting of an internal combustion engine for motor vehicles, comprising actuating means for causing the engine to stop and start, a plurality of electrical sensor means for outputting two-level electrical signals indicative of the running conditions of the engine, and an electronic monitoring and control unit with a microprocessor, having input connections to said sensor means and output connections to said actuating means, wherein said device comprises:

interrogation means for carrying out a succession of sequential cyclical scans of the outputs of said sensor means, and for generating at each scan, and producing at a prearranged output, a serial signal comprising a plurality of two-level signal portions, each indicative of the level of the signal output by a respective said sensor means, and

a separate signalling device which is electrically connectible to said interrogation means for converting the successive portions of said serial signal into corresponding perceptible signals.

4,561,297

HAND-HELD DIESEL ENGINE INJECTION TESTER

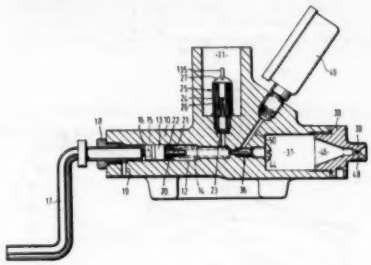
Ernest Holland, Daventry, England, assignor to V L Churchill Limited, Daventry, England

Filed Feb. 17, 1984, Ser. No. 581,063

Claims priority, application United Kingdom, Nov. 3, 1983, 8329399

Int. Cl.⁴ G01M *15/00*

U.S. Cl. 73—119 A **7 Claims**



1. A hand-held diesel engine injector tester, including a hand operable pump, a reservoir for liquid to be pumped, connection means sized to accept a diesel injector coupling pipe for said injector and a connection for a liquid pressure indicator.

4,561,298

VOLUME MEASUREMENT SYSTEM

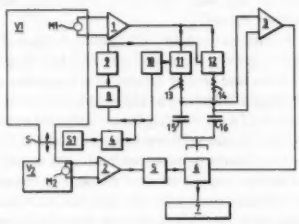
John B. Pond, 216 Prospect Rd., Farnborough, GU14 8SZ, England

Filed Jun. 29, 1984, Ser. No. 626,063

Claims priority, application United Kingdom, Jun. 30, 1983, 8317888

Int. Cl.⁴ G01F *17/00*

U.S. Cl. 73—149 **20 Claims**

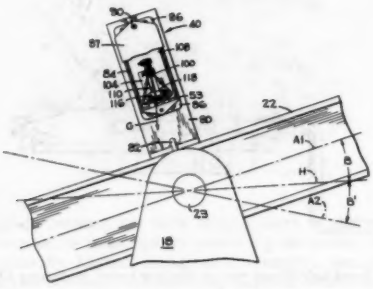


1. A method of measuring the free volume within a confined space, which comprises applying to the gas within the confined space repeated compressions of predetermined waveform by means of an electrically driven diaphragm one face of which is coupled to said free volume and the other face of which is coupled to a second, known volume; generating first electrical signals representative of the resultant variation of pressure within the confined space; repeatedly sampling said first electrical signals during moments of maximum diaphragm excursion; integrating the sampled signals to generate thereby a time-averaged first output signal; generating second electrical signals representative of the resultant pressure variation in said second, known volume; averaging said second electrical signals to generate a second ouput signal; and calculating the free volume of the confined space from the first and second output signals thus obtained.

4,561,299
APPARATUS FOR DETECTING CHANGES IN INCLINATION OR ACCELERATION

Franklin P. Orlando, Morgan Hill; Joseph S. Goulart, Santa Clara, and Rangasami S. Chandra, Walnut Creek, all of Calif., assignors to FMC Corporation, Chicago, Ill.

Filed Feb. 13, 1984, Ser. No. 579,624
Int. Cl.[4] G01C *9/06*
U.S. Cl. 73—151 1 Claim



1. In an apparatus for monitoring the operation of a well pumping unit which includes a walking beam having a sucker-rod string attached thereto and a power unit for oscillating said beam about a horizontal axis to reciprocate said rod string for producing fluid from an underground location, the improvement which comprises apparatus for detecting the position of the rod string during reciprocation of said rod string, said position detecting means comprising:

support means operatively connected to said walking beam for oscillatory movement;

means defining a magnetic-field sensor rigidly secured to said support means;

cantilever spring means having one end portion rigidly secured to said support means at a point removed from said sensor means;

magnet means secured to said cantilever spring means at a position removed from said one end and disposed closely adjacent to said sensor means, said magnetic means moving arcuately relative to said sensor means in response to oscillation of said walking beam between a centered position wherein said walking beam is at about the mid-point of its oscillatory movement and said cantilever spring means is disposed in a vertical plane over the center of said sensor means, and wherein pivotal movement of said walking beam in both directions from said centered position deflects said cantilever spring means due to gravitational forces acting on said magnet means from one side to the other side of said plane for providing a linear voltage output signal that is proportional to said relative movement and is useable for determining the position of said rod string;

weight means secured to said spring means at a location adjacent said magnetic means;

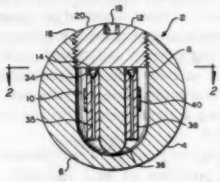
stop means rigidly secured to said support means on both sides of the path of movement of said weight means for preventing excessive deflection of and damage to said spring means; and

a printed circuit board rigidly secured to said support means and structurally supporting said magnetic-field sensor means, said cantilever spring means performing its functions with a high degree of repeatablility and with substantially infinite life at an extremely low price.

4,561,300
TEMPERATURE LOGGING WHILE DRILLING

John T. O'Brien, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 15, 1983, Ser. No. 561,696
Int. Cl.[4] E21B *47/06*
U.S. Cl. 73—154 17 Claims

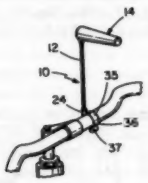


1. A temperature recorder comprising a casing having a generally spherical outer surface and a plug member mounted in said casing, said plug member being generally cylindrically or frustoconically shaped and mounted in said casing generally along a radius thereof, said plug member having a plurality of thermal indicators attached thereto.

4,561,301
MINIATURE WIND SOCK ASSEMBLY

Stanley O. Steele, 19 W. 720 Pierce Rd., Itasca, Ill. 60143

Filed Jul. 6, 1984, Ser. No. 628,430
Int. Cl.[4] A63H *33/40;* B65D *85/67;* G01P *13/02*
U.S. Cl. 73—188 10 Claims



1. A miniature wind sock, comprising: a bracket adapted to be releasably attached to a support, a flexible spring mast fixed to and extending upwardly from the bracket, and a frusto-conical wind sock connected to the upper end of the flexible spring mast, said mast having a flexible length at least three times the diameter of the wind sock and being sufficiently flexible so that the bracket and mast may be easily manually wound around the wind sock for insertion into a small container and then instantly unwound upon removal from the container.

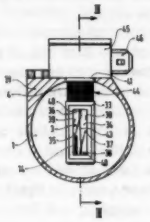
4,561,302
AIR FLOW RATE METER

Jaihind S. Sumal, Vaihingen, and Heinz Gneiss, Ludwigsburg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 10, 1984, Ser. No. 608,823
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1983, 3326047
Int. Cl.[4] G01F *5/00*
U.S. Cl. 73—202 8 Claims

1. An air flow rate meter comprising an electronic regulating circuit and a temperature-dependent measuring resistor including a carrier body arranged for insertion into the intake tube of a manifold, said carrier body having a rectangular aperture provided with surrounding walls to allow air flow therebetween, a compensating resistor being disposed within said aperture on one of said walls, a measuring resistor disposed

within said aperture and having terminal end portions being associated with at least two other of said walls, and a reference

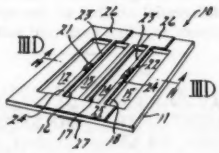


resistor being disposed circumferentially of said carrier body adjacent said aperture.

4,561,303
MASS AIRFLOW SENSOR WITH BACKFLOW DETECTION

Shaun L. McCarthy, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 6, 1984, Ser. No. 678,935
Int. Cl.[4] G01F *1/68;* H01L *35/00*
U.S. Cl. 73—204 **10 Claims**



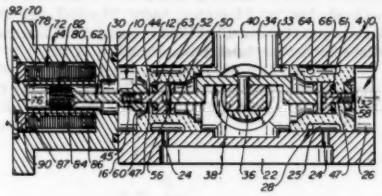
1. A mass airflow sensor with backflow detection including:
a first elongated, relatively thin silicon member positioned in an orienting plane, having a silicon oxide coating and having a metal coating;
a second and a third elongated, relatively thin silicon members positioned in the orienting plane, one on each side of said first silicon member, having a silicon oxide coating and each having a thermocouple metal coating; and
said thermocouple coating including a first metal coating at a first end of said second and third silicon members and a second metal coating at a second end of said second and third silicon members, said first and second metal coating having a region of overlap on a portion of said second and third silicon members so as to form a thermocouple.

4,561,304
POSITIVE DISPLACEMENT PISTON FLOWMETER

John K. Max, 1420 Healdsburg Ave., Healdsburg, Calif. 95448

Filed Dec. 15, 1983, Ser. No. 562,483
Int. Cl.[4] G01F *3/14*
U.S. Cl. 73—247 **27 Claims**

1. A radial piston flowmeter comprising:
a meter housing including means defining a fluid inlet and a fluid outlet;
means defining a plurality of cylinders formed in said meter housing arranged in equally spaced radial directions about a central position, said cylinders defining cylinder inder axes;
means defining passageways fluidly coupling said cylinders to said fluid inlet and said fluid outlet;
a piston mounted within each said cylinder for reciprocal movement therein; and
means for connecting said pistons to one another so movement of one piston causes corresponding movement of all of said pistons, said connecting means including connecting rods and universal joints coupling an end of said con-

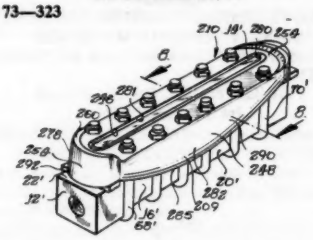


necting rods to said pistons to reduce off axis forces applied to the pistons by the connecting rods.

4,561,305
LIQUID SIGHT GAGE COVER

David L. Tremain, Sterling; Burt L. Beach, and David J. Rimington, both of Prophetstown, all of Ill., assignors to Houdaille Industries, Inc., Fort Lauderdale, Fla.

Filed Jun. 10, 1983, Ser. No. 502,937
Int. Cl.[4] B65D *25/54*
U.S. Cl. 73—323 **15 Claims**



1. In an improved liquid sight gage, including an improved cover; an elongated chamber block having longitudinally extending sidewalls and transversely extending endwalls connecting the sidewalls to define an elongated liquid chamber having an opening, and port means for communicating the liquid chamber with a liquid-containing vessel; a transparent lens covering said liquid chamber opening; sealing means for forming a seal between the lens and the chamber block; and a plurality of longitudinally spaced bolt means connecting said cover to the chamber block, the lens being disposed between the cover and the chamber block; the improved cover comprising
a pair of spaced, transversely extending end sections and a pair of spaced, longitudinally extending side beams defining a viewing slot into the liquid chamber, said side beams extending transversely outwardly of said chamber block, and a plurality of longitudinally spaced holes in said side beams disposed outwardly of said chamber block for receiving the bolt means,
said side beams having substantially continuously progressively increasing masses from said end sections to their centers, whereby said cover increasingly resists the increasing tendency of more central portions of the sidewalls to deflect when subjected to liquid pressure.

4,561,306

INSTRUMENTATION SUPPORT RING FOR HIGH-POWER ROTARY MACHINE ROTOR AND METHOD FOR ATTACHING SAME TO ROTOR SHAFT

Jean-Claude Marino, Montigny; André Marquet, and Philippe Wetzel, both of Paris, all of France, assignors to Electricite de France Service National, Paris, France

Filed Oct. 30, 1984, Ser. No. 666,570

Claims priority, application France, Nov. 2, 1983, 83 17401

Int. Cl.⁴ B29C *63/04*; G01D *21/00, 11/24*

U.S. Cl. 73—432 R **11 Claims**

1. Rotary machine rotor instrumentation support ring comprising two half-rings adapted to be attached to said rotor so as to remain attached thereto at speeds up to and in excess of the maximum speed thereof, an odd number of annular grooves in an outside cylindrical surface of said ring in an arrangement which is symmetrical relative to a median plane thereof, and a respective winding in each of said grooves made up of superposed turns of a tape of high-strength fibers immobilized under tension in a polymerized resin matrix.

4,561,307

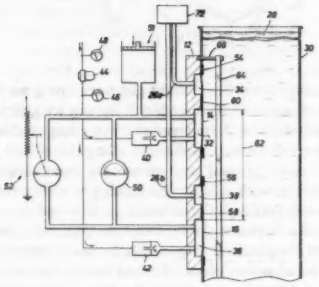
LIQUID DIFFERENTIAL PRESSURE MEASUREMENT USING A VERTICAL MANIFOLD

George E. Smith, 2115 S. Fountain Valley Dr., Missouri City, Tex. 77459

Filed Jan. 26, 1984, Ser. No. 574,035

Int. Cl.⁴ G01N *9/26*

U.S. Cl. 73—438 **21 Claims**



1. Apparatus for measuring the difference in pressure in a quantity of liquid between a first and second vertical location therein, comprising:

a manifold with a first side exposed to the liquid, said first side having a first pair of voids separated by a first fence at a first vertical location between said first pair of voids and a second pair or voids separated by a second fence at a second vertical location between said second pair of voids, said second location being above said first location, a first one of each pair of voids having two flow-through passages to the second side of said manifold and the second one of each pair of voids being vented,

a supply of pressurized gas,

a first flow restrictor connected to one of said flow-through passages of said first one of said first pair of voids and to said pressurized gas supply,

a second flow restrictor connected to one of said flow-through passages of said first one of said second pair of voids and to said pressurized gas supply,

meter means sensitive to pressure difference having a first connection to the second one of said flow-through passages of said first one of said first pair of voids and a second connection to the second one of said flow-through passages of said first one of said second pair of voids,

a first flexible membrane vertically tightly covering said first pair of voids and contacting said first fence therebetween,

a second flexible membrane vertically tightly covering said second pair of voids and contacting said second fence therebetween,

gas pressure from said first restrictor causing said first membrane to move slightly outwardly at said first fence at the hydrostatic pressure of the liquid applied thereagainst to vent the gas built up in said first void through said second void of said first pair of voids, said first void pressure being applied to said meter,

gas pressure from said second restrictor causing said second membrane to move slightly outwardly at said second fence at the hydrostatic pressure of the liquid applied thereagainst to vent the gas built up in said first void through said second void of said second pair of voids, said first void pressure being applied to said meter to result in a pressure differential reading of the hydrostatic liquid pressures between said first fence and said second fence.

4,561,308

IMAGE DISPLAY PROCESS BY ULTRASOUNDS FROM AN ALIGNMENT OF TRANSDUCER ELEMENTS

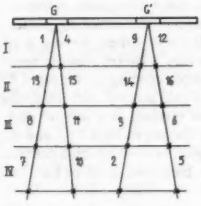
Robert Bele, Chessy, and Gilbert Micaletti, Lagny, both of France, assignors to CGR Ultrasonic, Meaux, France

Filed Mar. 14, 1984, Ser. No. 589,448

Claims priority, application France, Mar. 18, 1983, 83 04486

Int. Cl.⁴ G01N *29/04*

U.S. Cl. 73—626 **12 Claims**



1. In a method of acquiring signals representative of an internal portion of a structure and of displaying said signals as an image having the steps of:

selecting two groups of adjacent transducer elements in respective two sections of an alignment of transducer elements;

emitting from said alignment of transducer elements bursts of ultrasonic focalized beams to said structure;

receiving from said structure echoes corresponding to said ultrasonic focalized beams;

repeating said emitting of bursts of ultrasonic focalized beams and said receiving of corresponding echoes therefrom for several successive sequences;

differentiating by at least one transducer element for said two selected groups of adjacent transducer elements for each new sequence of said successive sequences, said differentiating effecting a propagating of said two selected

groups along said respective sections; said method comprising:

formulating for said emitting step a predetermined number of ultrasonic focalized beams from said two selected groups according to a predetermined succession of different focal patterns, said focal patterns being chosen from N possible focal patterns corresponding, respectively, to N possible focal zones of different depths parallelly defined in front of said alignment, said N being a chosen integer;

generating bursts of said predetermined ultrasonic focalized beams alternately from one of said two selected groups to the other when a given ultrasonic focalized beam does not correspond to the focal zone positioned furthest from said alignment of transducer elements, and

generating two successive bursts of said predetermined ultrasonic focalized beams from the same one of said two selected groups when the first of said predetermined ultrasonic focalized beams corresponds to the focal zone positioned furthest from said alignment of transducer elements.

4,561,309

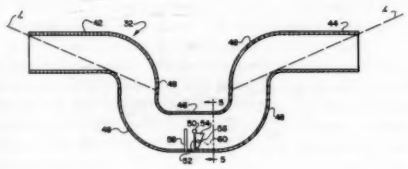
METHOD AND APPARATUS FOR DETERMINING PRESSURE DIFFERENTIALS

Stanley S. Rosner, 320 Whitestone Rd., Charlotte, N.C. 28211

Filed Jul. 9, 1984, Ser. No. 628,754

Int. Cl.[4] G01L *13/06*

U.S. Cl. 73—705 **21 Claims**



1. Apparatus for determining a pressure differential between first and second areas in which the pressure in one said area is higher than the other, said apparatus comprising:

(a) conduit means extending between said first and second areas to permit the free flow of air therethrough from said area having the higher pressure to the other said area, said conduit means being hollow and having a predetermined cross-sectional shape.

(b) pivot means mounted in said hollow conduit means to extend transversely thereacross with respect to said flow of air therethrough, and a movable vane element mounted on said pivot means to depend freely therefrom in the path of said air flow for pivotal movement determined by the quantity of said air flow, said movable vane element having a shape corresponding to the shape of said conduit means beneath said pivot means except for a small clearance between the edges of said vane element and said conduit; and

(c) sensing means for sensing the extent of said pivotal movement of said vane element and for generating a signal which is a function of said sensed movement of said movable means.

4,561,310

FLUID FLOW MEASUREMENT

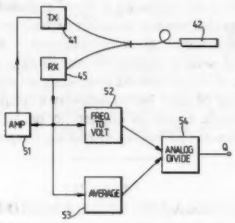
Richard H. Barnard, St. Albans, and Terence P. Stock, Bishops Stortford, both of England, assignors to ITT Industries, Inc., New York, N.Y.

Filed Feb. 6, 1984, Ser. No. 576,994

Claims priority, application United Kingdom, Feb. 11, 1983, 8303885

Int. Cl.[4] G01F *1/32, 1/86*

U.S. Cl. 73—861.02 **1 Claim**



1. An instrument for measuring the mass flow rate of a moving fluid, the instrument including means for generating vortices in the fluid, a pressure sensor disposed in the fluid and responsive to the pressure fluctuations associated with the vortices, means responsive to said pressure sensor for modulating a light signal with a frequency and amplitude corresponding respectively to the fluid flow velocity and the product of fluid flow velocity squared and the density, means for determining from the modulated light signal a measure of the mass flow rate of the fluid;

said modulation being affected by movement of an optical fiber in response to the vortex generation; and

negative feedback control means whereby the light signal is maintained at a substantially constant level.

4,561,311

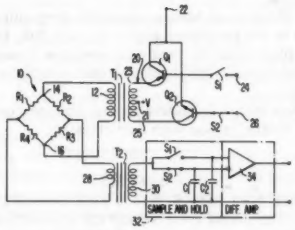
BRIDGE EXCITATION FOR SENSOR USED ON A VORTEX SHEDDING FLOW METER

Marion A. Keyes, IV, Chagrin Falls, and William L. Thompson, Montville, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Continuation-in-part of Ser. No. 329,633, Dec. 11, 1981, abandoned. This application Feb. 1, 1984, Ser. No. 576,041

Int. Cl.[4] G01F *1/32*

U.S. Cl. 73—861.22 **4 Claims**



1. A vortex shedding flow meter circuit comprising:

a sensor which varies its state with a vortex shedding frequency;

a drive circuit connected to an input of said sensor having means for applying A.C. single cycle bursts which are spaced in time by an amount greater than the duration of each burst to alternating opposite ends of said sensor for

driving said sensor to change its state with the vortex shedding frequency;

wherein said sensor comprises a bridge having at least one element which changes its state with the vortex shedding frequency and balancing elements, said drive circuit comprising a bridge drive transformer having an output coil connected to said bridge and an input coil, said drive circuit being effective to apply a positive one half cycle of each burst to one end of said input coil and a negative one half cycle of each burst to an opposite end of said input coil.

4. A method of operating a vortex shedding sensor circuit having a drivable sensor member which produces an output that varies at a vortex shedding frequency comprising:

driving the sensor member only during single cycle A.C. bursts which are spaced in time by an amount greater than a duration of each burst, wherein a frequency of said A.C. single cycle bursts is chosen to be at least five times a maximum of the vortex shedding frequency.

4,561,312

TURBINE FOR A MULTIJET LIQUID FLOW METER

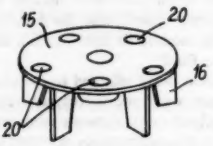
Daniel Roy, St. Louis, France, assignor to Sappel, St. Louis, France

Filed Nov. 22, 1983, Ser. No. 554,383

Claims priority, application France, Dec. 10, 1982, 82 20696; Jun. 7, 1983, 82 09396

Int. Cl.⁴ G01F *1/08*

U.S. Cl. 73—861.81 **8 Claims**



1. A turbine for a multi-jet liquid meter of the type including a counter and a housing having a first array of openings in a lower wall portion and a second array of openings in an upper wall portion, the first array facilitating influx of liquid into the housing and the second array facilitating outflux of said liquid from said housing so that a flow of said liquid is generated in said housing, said turbine comprising:

a thin horizontally disposed disk having a peripheral region and a central region, and wherein said disk includes means for slowing its speed of rotation during strong liquid flows;

shaft means for rotatably supporting said plate means in said housing;

and a plurality of blades supported perpendicular to, and only in the peripheral region of, said disk, for propelling said plate means in rotation in response to said liquid flow in said h ousing, said blades extending radially of said plate means;

said shaft means including means for interconnecting said disk central region with said counter.

4,561,313

DEVICE FOR MEASURING THE LONGITUDINAL TENSION IN A STRIP OF MATERIAL

Helmut Habermann, Vernon, and Maurice Brunet, Saint-Marcel, both of France, assignors to Societe Europeenne de Propulsion, Puteaux, France

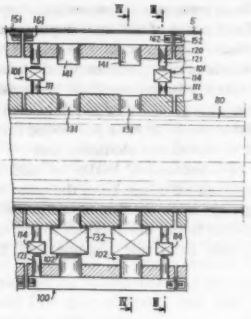
Filed Nov. 7, 1984, Ser. No. 669,089

Claims priority, application France, Nov. 18, 1983, 83 18435

Int. Cl.⁴ G01L *5/10*

U.S. Cl. 73—862.07 **10 Claims**

1. Device for measuring the longitudinal tension in a strip of material leaving a rolling mill, comprising a measuring roll over which the strip bearingly runs and load sensors associated with said measuring roll to supply a signal which is a function of the tensile stress in the strip of material bearing on said measuring roll, wherein said measuring roll consists of at least one roll mounted on active radial magnetic bearings which



form said load sensors, means for measuring the current in the windings of the active magnetic bearings, means for detecting the radial position of the rolls supported by said bearings and means for measuring the air gap in the magnetic bearings and keeping said air gap substantially constant.

4,561,314

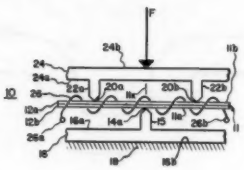
MAGNETOELASTIC FORCE/PRESSURE SENSOR

Robert P. Alley, Clifton Park; John D. Harnden, Jr., Schenectady, and William P. Kornrumpf, Albany, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 27, 1983, Ser. No. 546,227

Int. Cl.⁴ G01L *1/12*

U.S. Cl. 73—862.69 **25 Claims**



1. A force/pressure sensor, comprising:

a plurality of solid annular rings formed of a magnetoelastic material, said plurality of rings being arranged one stop another in a stack having opposed first and second major surfaces and an axis substantially perpendicular to said major surfaces:

a first member having a plurality of edges extended therefrom to abut against the first stack major surface at a like plurality of different locations thereon;

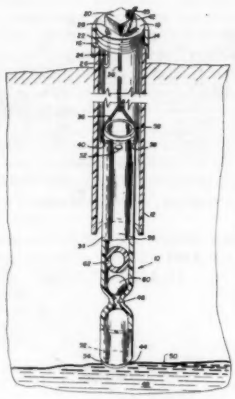
a second mamber having another plurality of edges extended therefrom to about against the second stack major surface at a like plurality of locations different from each other and also from the locations at which the first member edges abut said first stack major surface, said second member moving along said axis toward and distorting said ring stack in the direction of and responsive to an impingent force along said axis and to be measured; and

at least one coil means formed about a portion of the annular ring stack and adapted for measurement of a change in magnitude of the maximum magnetic flux density of the ring stack responsive to a change in magnitude of the axial force acting thereon.

4,561,315
LIQUID SAMPLING APPARATUS AND METHOD OF MANUFACTURE THEREFOR

Louis Ontek, RD #3, Box 365, Jackson, N.J. 08527

Filed Feb. 7, 1983, Ser. No. 464,589
Int. Cl.[4] G01N *1/12*
U.S. Cl. 73—864.64 8 Claims



1. A liquid sampling apparatus for use in a well pipe having a removable cap comprising:

(a) a unitary elongated hollow housing means for insertion into said well pipe, the internal diameter of said well pipe being larger than the outer diameter of said hollow housing means, said housing means including;

(i) retaining means disposed on one end for retaining one end of a flexible line thereon, and

(ii) valve seat means displaced from the other end of said housing means, said valve seat means being an integral part of said housing and extending inwardly; and

(b) spherical valve means disposed between said valve seat means and said one end of said housing means, said valve means moving freely within said housing means and adapted to cooperate with said valve seat means to retain liquids disposed between said valve seat means and said housing one end.

4,561,316
STARTER FOR INTERNAL COMBUSTION ENGINES

Ludwig Bolz, Waiblingen, and Walter Rühle, Korntal, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 500,975, Jun. 3, 1983, abandoned. This application Apr. 16, 1985, Ser. No. 723,003
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1982, 3225957
Int. Cl.[4] F02N *11/00*
U.S. Cl. 74—7 E 16 Claims

1. Starter motor unit for an internal combustion engine having

a dynamo electric machine including a housing structure (2, 9, 10);

a stator (3) and a rotor including a rotor shaft (4) an armature (5) secured to the shaft;

a drive shaft (8);

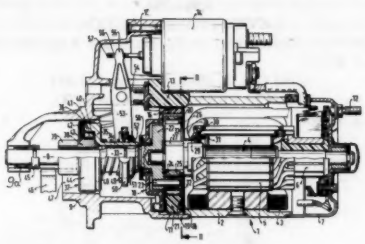
a starter pinion (39) rotatably and longitudinally movable on the drive shaft located for engagement with a flywheel ring gear (46) of the internal combustion engine;

a meshing drive (33, 34, 37) for selectively engaging the pinion (39) with the flywheel ring gear (46);

a planetary gearing (20, 22, 23, 25, 27) coupling the rotor shaft (4) and the drive shaft (8);

and a separating plate (28) separating the dynamo electric machine (1) and the planetary gearing;

and comprising, in accordance with the invention

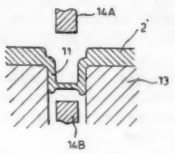


damping means (18) secured to the ring gear or annulus (20) of the planetary gearing and resiliently securing said ring gear or annulus of the planetary gearing within the housing structure.

4,561,317
ARM MECHANISM FOR A PUSHBUTTON TYPE TUNER

Kazuhiko Okamoto, and Takao Chaki, both of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Dec. 13, 1983, Ser. No. 561,249
Claims priority, application Japan, Dec. 14, 1982, 57-188023[U]
Int. Cl.[4] F16H *35/18;* H03J *5/06;* B21D *22/24*
U.S. Cl. 74—10.33 2 Claims



1. In an arm mechanism for a pushbutton tuner which comprises a frame body having an elongated slit therein, a pushbutton movable in a direction lengthwise of said slit, a frequency defining plate, a memory slide engageable by said frequency defining plate and adapted to be set in a position corresponding to a desired tuning frequency by lengthwise movement of said pushbutton, the improvement which comprises:

an elongated arm plate coupled to said pushbutton and extending lengthwise of said slit, said arm plate having an upper and a lower surface, and means rotatably supporting said frequency defining plate on the upper surface of said arm plate;

a plate spring mounted on the upper surface of said arm plate, said plate spring being coupled to said pushbutton for movement therewith in a direction lengthwise of said slit, said plate spring being adapted to lock said frequency defining plate at its periphery;

a hollow, cup-shaped projection extending downwardly from the bottom surface of said arm plate and extending into said slit for closely guided sliding movement therein so that lengthwise movement of arm plate is guided by said slit, said projection having been formed by moving an upper punch downwardly against the upper surface of a planar arm plate to thereby emboss said arm plate and form a hollow substantially cup-shaped projection the side wall of which tapers in a downward direction and then

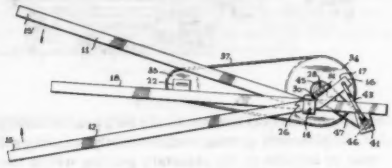
moving a lower punch upwardly against the central portion of the lower surface of said projection whereby to reshape said side wall so that said side wall is substantially perpendicular to the surface of said arm plate.

4,561,318

LEVER POWER SYSTEM

Douglas R. Schirrmacher, 19201 Dearborn Ave., Northridge, Calif. 91324

Filed Oct. 5, 1981, Ser. No. 309,201
Int. Cl.⁴ F16H *25/16*; B62M *1/00*
U.S. Cl. 74—54 **1 Claim**



1. In a power multiplier apparatus for translating an input power force into an increased power output, the combination comprising:

a power multiplier unit having lever means characterized as having a mechanical advantage greater than one;

drive means including a main axle for imparting a driving force constituting said increased power output to a load;

cam means operably interconnecting said lever means to said drive means for transmission of power therebetween;

a timing means operably interconnecting said cam means with said lever means for maintaining synchronization between said cam means and said lever means;

said timing means includes a timing axle rotatably carried in parallel spaced apart relationship with respect to said main axle;

a driven timing gear fixed on said timing axle and a drive timing gear of greater diameter carried on said main axle;

a timing chain operably coupled about said drive and driven timing gears; and

a crank shaft and connecting arm means movably mounting said timing axle to said lever arms.

4,561,319

ARRANGEMENT FOR JOURNALLING LARGE ECCENTRIC FORCES

Per Lilja, Karlskrona, Sweden, assignor to Dynapac AB, Solna, Sweden

Filed Jan. 25, 1984, Ser. No. 573,861
Claims priority, application Sweden, Jan. 26, 1983, 8300373
Int. Cl.⁴ F16H *33/00*
U.S. Cl. 74—61 **6 Claims**

1. An arrangement for journalling large eccentric forces generated by a rotating eccentric assembly including at least two eccentrically-loaded members, the arrangement comprising:

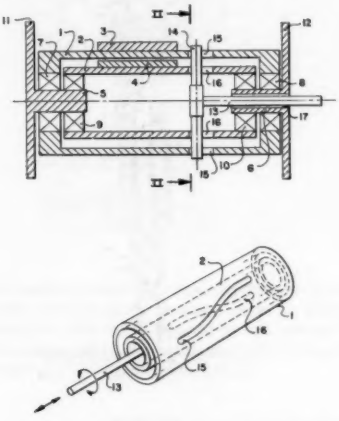
first journal means and second journal means spaced from each other and conjointly defining a common journalling axis;

a first pair of bearings for rotatably journalling a first one of said eccentrically-loaded members on said first journal means and said second journal means;

a second pair of bearings for rotatably journalling a second one of said eccentrically-loaded members directly on said first journal means and said second journal means independently of said first eccentrically-loaded member;

said eccentrically-loaded members being tubular members each having a tubular wall and an axis of rotation coincident with said common journalling axis and being loaded with an eccentric weight; and,

drive means for engaging and driving said eccentrically-loaded members, said drive means including: bearing means disposed on said axis and defining a journalling axis coincident with said common journalling axis; first engaging means and second engaging means formed in the



respective tubular walls of said tubular members at respective locations spaced away from said common axis; and, a drive member journalled in said bearing means configured to engage and drive said tubular members at said first engaging means and said second engaging means, respectively, whereby eccentric forces generated by the tubular members during rotation thereof are prevented from acting on said drive member.

4,561,320

TWO-WAY PAWL-RATCHET WHEEL ASSEMBLY

Grover K. Houpt, Wayne, and Richard Kayros, Bristol, both of Pa., assignors to American Manufacturing Company, Inc., King of Prussia, Pa.

Filed Dec. 28, 1981, Ser. No. 335,253
Int. Cl.⁴ F16H *27/02*; G05G *1/00*
U.S. Cl. 74—128 **7 Claims**

1. A two-way pawl assembly for actuation of a ratchet wheel comprising:

(a) reciprocating means capable of rotation about its axis to first and second different rotary positions, said means having a resilient portion adapted to engage said wheel at a first point thereon when said reciprocating means is in said first rotary position and is reciprocated thereby turning said wheel by incremental steps in a first rotational direction, said reciprocating means including an elongated rigid means to which said resilient portion is attached for

reciprocal movement in unison therewith, the axis of said elongated rigid means being aligned with the center of said wheel and wherein in said first rotary position said first point engaged by said resilient portion is located on a first side of a diameter of said wheel aligned with the axis of said elongated member, and

(b) means enabling rotation of said reciprocating means to said second rotary position whereupon said portion is adapted to engage said wheel at a second point thereon, said second point being located on the other side of said wheel diameter, thereby turning said wheel in a second rotational direction opposite said first rotational direction, and further wherein said incremental steps correspond to the engagement of successive adjacent teeth of said wheel by said resilient portion.

4,561,321

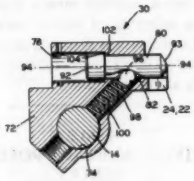
SHIFT BRACKET ASSEMBLY

James A. Yarnell, Temperance, Mich., assignor to Dana Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 370,640, Apr. 21, 1982, abandoned. This application Nov. 21, 1983, Ser. No. 553,653

Int. Cl.⁴ G05G *9/14*

U.S. Cl. 74—473 R **7 Claims**



1. In a shift bracket assembly for a manually operated transmission, said bracket disposed for affixation to, and movement with, an axially movable shift rail, said bracket including shift finger engaging means. and a transversely aligned bore terminating at said engaging means, a plunger slidably disposed within said bore, one end of said plunger defining means for contacting a shift finger, the opposite end thereof including means for limiting transverse movement of said plunger; an improvement comprising said plunger defining a cam surface, said surface angled in a direction toward said shift finger engaging means, and means for urging said plunger against said means for limiting transverse movement of said plunger toward said shift finger, said means for urging being constantly biased into engagement with said surface in all operative position of said plunger, and wherein said means for urging further comprises a spring loaded poppet ball defined by a spring and poppet ball, said spring bearing against said rail, said ball in contact with said surface of said plunger, said ball being interposed between said spring and said furface.

4,561,322

MOTOR VEHICLE TRANSMISSION

Otto Hausinger, Gerlingen, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengellschaft, Fed. Rep. of Germany

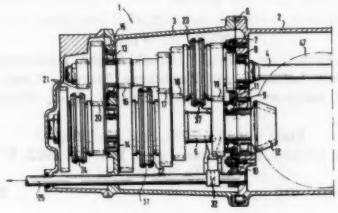
Filed Apr. 19, 1984, Ser. No. 601,963

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1983, 3314411

Int. Cl.⁴ G05G *9/18*

U.S. Cl. 74—475 **15 Claims**

1. A motor vehicle transmission with a four-lane shifting arrangement for five forward speeds and a reverse speed for vehicles with a front engine, comprising a change-speed transmission means including housing means and an axle gear means, an input shaft operable to be driven from an engine and an output shaft operable to drive a vehicle axle by way of the axle gear means, shifting rods coordinated to the transmission speeds which are supported substantially horizontally in the housing means substantially parallel to the input shaft and output shaft, and shifting fingers for actuating said shifting rods, said shifting fingers being provided at a shifting lever means, a spatially fixed guide shaft disposed substantially perpendicularly to the shifting rods, said shifting lever means being longitudinally movable supported on said guide shaft for the preselection of the shifting lanes and being rotatably supported thereon for the engagement of the speeds, a shifting



shaft disposed sutstantially parallel to the shifting rods inserted into the transmission housing means within the upper area thereof, means operatively connecting said shifting shaft with said shifting lever means including arms at the shifting lever means and at the shifting shaft which are pivotally connected with each other, the shifting lever means including a shifting finger for the actuation of the shifting rods of the third and fourth speed, of the first and second speed as well as of the reverse speed and a second shifting finger for the engagement of the fifth speed.

4,561,323

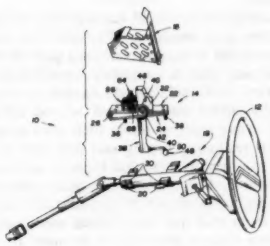
ADJUSTABLE STEERING COLUMN ASSEMBLY AND MECHANISM THEREFOR

Clinton V. Stromberg, Allen Park, Mich., assignor to American Motors Corporation, Southfield, Mich.

Filed Feb. 9, 1984, Ser. No. 578,554

Int. Cl.⁴ B62D *1/18*; G05G *5/06*

U.S. Cl. 74—493 **10 Claims**



1. An adjustable mechanism for a steering column assembly of a vehicle, the mechanism comprising:

first and second plates, one of said plates being adapted to be mounted to said vehicle, said first plate including at least one wall member attached thereto and extending therefrom, said wall member having a plurality of spaced notches formed therein; the other of said plates being adapted to be attached to said steering column and movable therewith adjacent and relative to said one plate;

first spring means including at least one compression spring for urging the first and second plates together;

hinge means for hingedly connecting said first and second plates to permit angular movement between the plates about a hinge axis; and

a locking mechanism including a lever pivotally connected

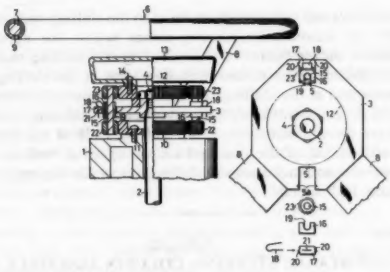
to said second plate, the lever including a locking portion extending between the first and second plates, said locking mechanism including second spring means for urging a part of said locking portion into one of said notches to lock the first and second plates in one of said like plurality of angular positions and wherein said lever includes an actuating portion extending away from said first plate for pivoting the lever against the biasing action of the second spring means to unlock the first and second plates to permit the adjustment of said angular position.

4,561,324

STEERING WHEEL

Tetsushi Hiramitsu, Kasugai; Hiroshi Sugita, Ichinomiya; Satoshi Ono, Inazawa, and Zenzaburo Murase, Konan, all of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Dec. 22, 1983, Ser. No. 564,192
Claims priority, application Japan, Dec. 24, 1982, 57-233139
Int. Cl.[4] B62D *1/20*
U.S. Cl. 74—498 **5 Claims**



1. A steering wheel comprising:

a steering shaft carrying thereon a boss plate, a first sun gear secured to a column and a second sun gear secured to a pad, said boss plate being rotatable with said steering shaft, said sun gears being rotatable relative to said steering shaft;

at least one planetary shaft having one end on which a first planetary gear meshing with said first sun gear is supported, while a second planetary gear meshing with said second sun gear is supported on the other end of said planetary shaft, said first and second planetary gears being rotatable about said first and second sun gears, respectively, while rotating about their own axes;

means for resiliently urging said first and second planetary gears to normally maintain them in intimate engagement with said first and second sun gears, respectively, while allowing displacement of said first and second planetary gears from said first and second sun gears, respectively; said boss plate is provided at its outer periphery with at least one recess in which said planetary shaft is rotatably supported by a bearing member and said urging means comprises a resilient device urging said bearing member radially of said sun gears.

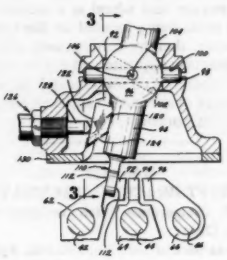
4,561,325

TRANSMISSION AND RANGE BOX CONTROL

Terry L. Jester, Stony Ridge, Ohio, assignor to Dana Corporation, Toledo, Ohio 43697

Filed Oct. 20, 1983, Ser. No. 543,525
Int. Cl.[4] F16H *3/02, 3/08*
U.S. Cl. 74—745 **20 Claims**

1. A gear ratio selection device for use with a transmission assembly comprising, in combination, a main gear box having an input shaft, an output shaft, a plurality of gear sets providing a plurality of independently selectable gear ratios between said input shaft and said output shaft, a pivotally disposed shift lever, at least one shift rail, a shift yoke secured to said shift rail and including a slot for receiving a portion of said shift lever, a pair of aligned, spaced-apart, stationary guide means for limiting movement of said shift lever along a first path and a second path parallel to said first path while said portion of said



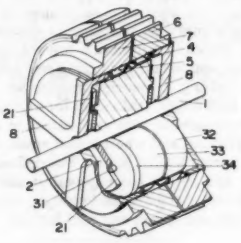
shift lever is disposed within said slot, auxiliary gear box means in tandem with said main gear box for providing at least two selectable gear ratios, control means activated by said shift control lever for selecting of one of said auxiliary gear box ratios when said shift lever is disposed along said first path and selecting the other of said two gear ratios when said portion of said shift lever is along said path.

4,561,326

FRICTION DRIVE PLANETARY ROLLER TYPE SPEED REDUCER

Takafumi Hamabe, Hikone; Hirozo Imai, Hirakata, and Hikoyoshi Hara, Shijonawate, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Aug. 21, 1984, Ser. No. 642,798
Claims priority, application Japan, Mar. 2, 1982, 57-33369
Int. Cl.[4] F16H *13/06*
U.S. Cl. 74—798 **4 Claims**



3. A speed reducer comprising:

a cylindrical input shaft of substantially uniform diameter along substantially the entire length thereof;

at least one planet roller surrounding the input shaft to be in rolling contact therewith, said planet roller comprising a first roller section, a second roller section and a third roller section which have a common axis parallel with the axis of the input shaft and which are aligned axially with said second roller being disposed between said first and third rollers, said first roller section and said third roller section having substantially equal diameters which are larger than that of the second roller section, such that the first roller section and the third roller section are respectively in rolling contact with the input shaft at axially spaced portions thereof; and

first and second output rings which are coaxial with the

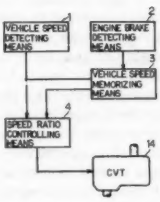
input shaft to surround the planet roller, and which are respectively in rolling contact with the first and second roller sections, whereby the common axis of the planet roller is kept parallel to at least one of an axis of the input shaft and an axis of the output rings during rotary motion, each output ring being formed from a spring having a U-shaped cross-section, said output rings being pressed against said planet roller so that the roller section with the largest diameter presses against said input shaft, each output ring being for selective connection to a load to drive it, whereby when one of the output rings is held stationary, the other output ring is driven by the input shaft to effect a differential rotary motion due to the differences between the outside diameters of the output rings and between the inside diameters of the output rings for providing a high reduction ratio.

4,561,327

APPARATUS FOR CONTROLLING SPEED RATIOS OF A CONTINUOUSLY VARIABLE TRANSMISSION

Takao Niwa; Takeshi Gono, and Akinori Osanai, all of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed May 21, 1984, Ser. No. 612,653
Claims priority, application Japan, May 26, 1983, 58-93037
Int. Cl.⁴ B60K *41/12, 41/18*
U.S. Cl. 74—866 **5 Claims**



1. An apparatus for controlling speed ratios of a continuously variable transmission installed in a vehicle having an engine therein, the transmission having an input shaft and an output shaft and the speed ratio of a rotating speed of the output shaft to a rotating speed of the input shaft being continuously varied, comprising:

a means for detecting an actual vehicle speed;

a means for detecting an engine brake of the vehicle;

a means for memorizing a desired vehicle speed under a condition when the vehicle runs under the effect of the engine brake; and

a speed ratio control means which controls the speed ratios of the continuously variable transmission so that the desired vehicle speed may equal the actual vehicle speed.

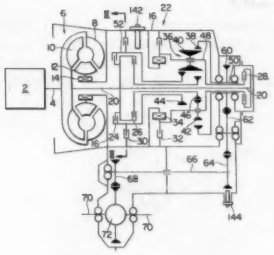
4,561,328

CREEPING PREVENTING APPARATUS IN AUTOMATIC TRANSMISSION FOR VEHICLE

Takeo Hiramatsu, c/o Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Kyoto Seisakusho 1, Uzumasatatsumicho, Ukyo-ku, Kyoto-shi, Kyoto, Japan

Continuation-in-part of Ser. No. 451,385, Dec. 20, 1982. This application Jul. 12, 1983, Ser. No. 512,970
Claims priority, application Japan, Jul. 14, 1982, 57-122761
The portion of the term of this patent subsequent to Apr. 30, 2002, has been disclaimed.
Int. Cl.⁴ B60K *41/16, 41/18*
U.S. Cl. 74—869 **4 Claims**

1. In an automatic transmission for a vehicle comprising a plurality of friction engaging units hydraulically selectively actuated to establish a plurality of speed stages, said plural friction engaging units including at least a first friction engaging unit engaged for attaining a low forward speed stage of a relatively large gear ratio and a second friction engaging unit engaged together with said first friction engaging unit for attaining a high forward speed stage of a relatively small gear ratio, said second friction engaging unit only being released for carrying out a shift from said high forward speed stage to said low forward speed stage, an apparatus for preventing creeping of the vehicle comprising first sensor means for sensing whether or not the accelerator pedal is released or whether or not the throttle valve is full closed, second sensor means for sensing whether or not the vehicle is in its halted state, shift control means for engaging said first and second friction engaging units in response to the two output signals from said first and second sensor means thereby attaining said high forward speed stage, and fluid pressure control means for reducing the pressure of hydraulic fluid supplied to said second friction engaging unit to a level lower than that of hydraulic fluid supplied to said first friction engaging unit, in response to the two output signals from said first and second sensor means, said second friction engaging unit including a drum connected to one element of a transmission gear mechanism, a brake band adapted to grip an outer circumferential surface of said drum, a hydraulic device for urging one end of said brake band into engagement with said drum, said one end of the brake band being located with respect to the other end thereof in a direction that said drum tends to rotate when said high forward speed stage is attained, and a fixing member for fixedly holding the other end of said brake band.

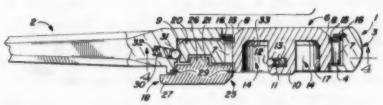


4,561,329

LOW PROFILE RATCHET WRENCH

Larry H. Lack, Bossier City, La., assignor to Frank M. Auer; C. J. Auer and Paul B. Lindenmayer, all of Shreveport, La.

Filed Mar. 8, 1984, Ser. No. 587,361
Int. Cl.⁴ B25B *13/46*
U.S. Cl. 81—62 **13 Claims**



1. A low profile ratchet wrench comprising:

(a) a handle and a substantially round housing provided on one end of said handle, said housing having a top surface and a bottom surface;

(b) a ratchet drum rotatably located in said housing, said ratchet drum having an external peripheral surface, drum teeth on at least a portion of said external peripheral surface, a hollow interior, a closed end substantially coextensive with said top surface and an open end opposite said closed end and substantially coextensive with said bottom surface of said housing;

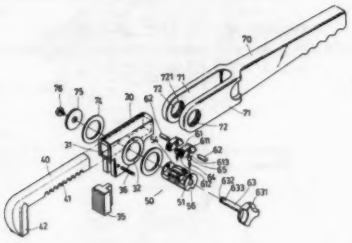
(c) a tang drive carried by said closed end of said ratchet drum, said tang drive disposed substantially in the center of said hollow interior of said ratchet drum and extending from said closed end toward said open end; and

(d) ratchet means provided in said handle adjacent said housing in selective engagement with said drum teeth, whereby engagement of said drum teeth in a selected orientation by said ratchet means causes rotation of said ratchet drum in a selected direction responsive to rotatable manipulation of said handle in said selected direction.

4,561,330
PIPE WRENCH

Chao-Yang Chen, No. 585, San-Feng Rd., Feng-Yuan City, Taiwan

Filed Nov. 2, 1984, Ser. No. 667,538
Int. Cl.⁴ B25B *13/22*
U.S. Cl. 81—129.5 **2 Claims**

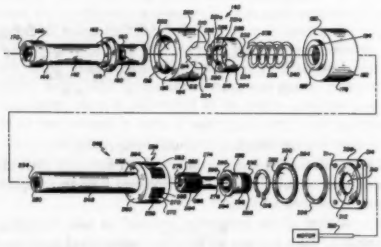


1. A pipe wrench including a body having a fixed jaw, a handle having two parallel arms being pivotably mounted with the body, a rack bar slidably mounted in the body and carrying a movable jaw, a driving gear located in the body and meshing with the rack bar, characterized in that: each of said parallel arms is provided with a opening and said openings are axially aligned with respect to each other, each opening is provided with internal teeth; said driving gear coaxially mounted across said openings; and a detent member mounted on said driving gear for engaging with said internal teeth and holding said driving gear against rotation in one direction.

4,561,331
WHEEL RIM WRENCH

Russell W. Pratt, Sr., 236 E. Whitley St., Churubusco, Ind. 46723

Filed Aug. 2, 1984, Ser. No. 637,142
Int. Cl.⁴ B25B *21/02, 17/00*
U.S. Cl. 81—464 **9 Claims**



1. A tool for use in rotating a nut threadedly received on a mediately disposed threaded portion of an elongate connector having a contoured outside end and simultaneously holding the connector stationary, wherein the nut in conjunction with the connector are adapted to facilitate the retention to a brake drum of an outside wheel rim of a dual rim self-aligning wheel rim, the tool comprising:

a motion means for providing rotational motion at an output element thereof when said motion means is in a selected condition;

a wrench means for engaging the nut so that the nut may be rotated;

a drive for connecting the output element of said motion means to said wrench means so that said wrench means rotates the nut when engaged thereto and when said motion means is in the selected condition, said drive means includes a drive member having opposite ends, external gear teeth formed in said drive member adjacent one of said ends, and a receiving bore opening at the other of said ends so as to be receivable of said output element;

an axially stationary holding means for engaging the contoured end of the connector so as to hold the connector stationary during rotation of the nut, said holding means including a socket portion that engages the contoured end, and said socket portion being completely contained within said wrench means, said holding means further includes a solid elongate holder member having opposite ends, said socket portion being at one end of said holder member;

a planetary gear means, at the other end of said elongate member, for operatively connecting said drive member to said connection assembly so that said wrench means rotates upon the rotation of said drive member, said planetary gear means includes a cylindrical gear housing, and a plurality of circumferentially-spaced planetary gears rotatably mounted to said cylindrical gear housing, and

a connection assembly connected to said wrench means, said connection assembly includes a hollow connector housing containing a plurality of gear teeth in the interior surface thereof, said planetary gear means being received within said connector housing so that said planetary gears engage said interior gear teeth whereby said connector housing rotates upon the rotation of said planetary gears, and a hammer-anvil assembly operatively connected to said wrench means and to said hollow connector housing so that said wrench means rotates upon the rotation of said connector housing.

4,561,332
TORQUE WRENCH

Harold L. Wood, Lower Templestowe, Australia, assignor to Repco Limited, Melbourne, Australia

Filed Jan. 27, 1984, Ser. No. 574,331
Claims priority, application Australia, Jan. 27, 1983, PF7799
Int. Cl.⁴ B25B *23/142*
U.S. Cl. 81—479 **12 Claims**

1. A torque wrench including, a reaction bar, a work engaging head secured to an end of said bar, a handle at the end portion of said bar remote from said head, a pair of cooperable members attached to said head and bar respectively and being engageable as a consequence of said bar flexing under torque applied to said head through sdid bar, one said cooperable member being movable in response to said engagement so as to adopt a signal generating position, an electrical circuit including signal generating means, actuator means responsive to said movable member adopting said signal generating position to cause said circuit to close and thereby generate a signal and maintaining said circuit closed until said movable member moves away from said signal generating position, said actuator means including a switch having a plunger which is axially movable between positions at which it causes said circuit to open and close respectively, and a pivoted lever which is spring influenced into engagement with said plunger to thereby prevent movement of aaid plunger into the circuit

closed position, and said movable member is operable to engage said actuator lever and move it against its spring influence to allow said plunger to adopt the circuit closed position.

4,561,333

DIAMOND TURNING METHOD FOR HIGH-PRECISION METAL MIRROR

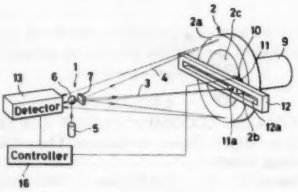
Tsuguo Kohno, Tokorozawa; Yoshitaro Yoshida, Chiba; Koji Tenjinbayashi, and Yuichi Okazaki, both of Ibaraki, all of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Feb. 24, 1983, Ser. No. 469,407

Claims priority, application Japan, May 20, 1982, 57-85297

Int. Cl.⁴ B23B *1/00, 5/40, 25/06*

U.S. Cl. 82—1 C **3 Claims**



1. A method for precision turning of a metal mirror by means of a cutting tool, which comprises the steps of:

rotating said metal mirror;

irradiating a freshly turned area of the reflecting surface of said metal mirror being turned with a measuring beam;

irradiating areas of said reflecting surface of said metal mirror, which have already been turned prior to the turning of said freshly turned area, with a plurality of diverging reference beams;

detectng the relative inclinations of said measuring beam and said plurality of diverging reference beams reflected from said freshly turned and prior turned areas of said metal mirror and generating output signals indicative of said relative inclinations of said measuring and reference beams; and

controlling the position of said cutting tool in response to said control signals so as to achieve uniform turning properties over the entire reflecting surface of said metal mirror being turned.

4,561,334

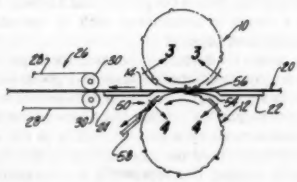
ROTARY STRIPPER

Albert J. Sarka, West Bloomfield, Mich., assignor to Bernal Rotary Systems, Inc., Troy, Mich.

Filed Jun. 19, 1984, Ser. No. 622,078

Int. Cl.⁴ B26D *7/18*

U.S. Cl. 83—27 **21 Claims**



18. A method of removing pieces cut from a web of material comprising: corotating a pair of cylinders of metal in generally superimposed relation to pass a web of material between them, transferring to one of the cylinders a piece of material cut from the web, releasably securing such piece of material to the one cylinder for rotation therewith to carry such cut piece away from the web, moving the leading edge of such cut piece generally radially away from such one cylinder while such one piece is retained thereon, and, after such cut piece has been moved away from such web by rotation of such one cylinder and the leading edge of such one piece has been moved away from such one cylinder, removing such piece from such one cylinder and moving such one piece along a path generally tangential to the outer periphery of such one cylinder, whereby such piece is separated and removed from the web and the path of travel of the web.

4,561,335

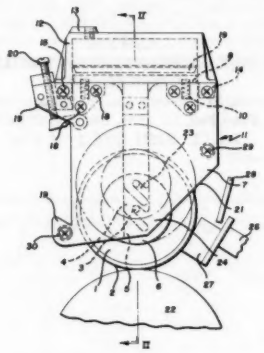
SLITTING MECHANISM HAVING A REMOVABLE BLADE

Peter P. Wingen, Overath, Fed. Rep. of Germany, assignor to Dienes Werke für Maschinenteille, GmbH & Co. KG, Overath, Fed. Rep. of Germany

Filed Sep. 21, 1983, Ser. No. 534,373

Int. Cl.⁴ B26D *1/22*

U.S. Cl. 83—481 **4 Claims**



1. Cutting mechanism which is arranged to be mounted alongside other identical cutting mechanisms on a horizontal support bar for the longitudinal cutting of sheet material which is passed between the cutting mechanism and a counterpressure roller, the cutting mechanism comprising:

(a) a guide frame which is formed by two flat vertical plates having opposed and spaced inner flat surfaces, one side of said guide frame being mounted on said support bar so that the plates extend substantially perpendicularly from the bar, each of said plates having a generally horizontal bottom edge, a substantially vertical side edge and a sloped edge, said bottom edge being spaced from and facing said counterpressure roller, and extending from said one side to a first point which is between said one side and the opposite side of said frame, said vertical side edge being located at said opposite side of the frame and terminating at a second point which is substantially higher than said bottom edge, said sloped edge extending from said first point to said second point, said bottom edges defining a bottom opening in said guide frame, said sloped edges defining a sloped opening in said frame, said inner flat surfaces having opposed vertical grooves which extend to said bottom edge and opposed inclined grooves which extend from the lower end of said vertical grooves to said sloped opening,

(b) a fluid pressure actuator including a housing which is mounted on top of said guide frame and a piston which is mounted for vertical movement within said housing,

(c) a carrier which is connected at its upper end to said piston and which includes a pair of spaced arms which are slidably mounted in said opposed vertical grooves, the

lower end of each arm having an inclined slot which has an opening that faces said sloped edge,

(d) a disc blade which is positioned between said flat plates and including an axle which is located in said inclined slots to enable the disc blade to rotate about an axis which is perpendicular to the flat plates and to enable the disc blade to be moved vertically upon vertical movement of the carrier by said piston between a lower position in which the disc blade projects below the bottom edges of said plates and bears against said counterpressure roller and an upper position in which the bottom of the disc blade is substantially spaced from the roller, said axle being slidably mounted in said inclined slots so that the disc blade can be removed from the frame through said bottom opening and said sloped opening when the disc blade is in the upper position, and

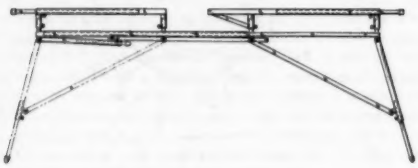
(e) stiffening means for connecting said flat plates at a third point which is adjacent said second point, said third point being located below the top of the disc blade when the disc blade is in its upper position and spaced from the counterpressure roller a distance which is greater than the diameter of the disc blade.

4,561,336

PORTABLE UNIVERSAL POWER MITER SAW WORKBENCH

Harold E. Davis, 31 Fairview La., Naugatuck, Conn. 06770

Filed Feb. 23, 1984, Ser. No. 582,834
Int. Cl.⁴ B25H *1/16, 1/14, 1/06*
U.S. Cl. 83—859 **10 Claims**



1. A portable universal power miter saw workbench comprising a power tool supporting site mounted on a pair of leg assemblies and a workpiece supporting surface mounted above and substantially parallel to said power tool supporting site, first adjustment means between said power tool supporting site and said workpiece supporting surface for adjusting the position of said workpiece supporting surface relative to said power tool supporting site and second adjustment means associated with said power tool supporting site for adjusting the length of said power tool supporting site and said workpiece supporting surface.

4,561,337

DIGITAL ELECTRONIC MUSICAL INSTRUMENT OF PITCH SYNCHRONOUS SAMPLING TYPE

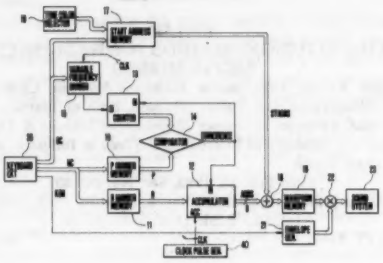
Masatada Wachi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed May 16, 1984, Ser. No. 611,367
Claims priority, application Japan, Jun. 8, 1983, 58-100840
Int. Cl.⁴ G10H *1/00*
U.S. Cl. 84—1.01 **10 Claims**

8. In a digital electronic musical instrument of the type in which a musical tone is generated in accordance with provided phase angle information, the improvement for providing pitch synchronization, comprising:

accumulator means for accumulating, at a fixed clock rate, a phase angle value which is different in accordance with the note name of said musical tone, the accumulated phase angle values corresponding to said phase angle information from which said musical tone is generated, and

means for resetting said accumulator means to a fixed value each time the accumulator has been incremented a certain number of times, said certain number representing the



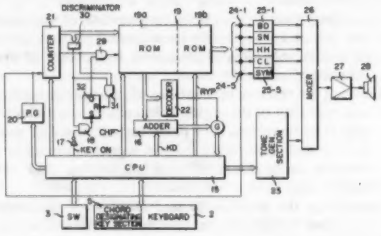
number of sampling periods required for production of one period of the musical tone being generated.

4,561,338

AUTOMATIC ACCOMPANIMENT APPARATUS

Hiroko Ohno, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 415,350, Sep. 7, 1982. This application Aug. 17, 1984, Ser. No. 642,724
Claims priority, application Japan, Sep. 14, 1981, 56-144959
Int. Cl.⁴ G10F *1/00*
U.S. Cl. 84—1.03 **12 Claims**



1. An automatic accompaniment apparatus for performing a music piece having a plurality of predefined measures, each of said plurality of measures having the same given number of beats, comprising:

bass pattern memory means for storing a plurality of bass pattern data at corresponding address locations, wherein at least one of said plurality of bass pattern data represents a pattern extending for more than one measure of said musical piece being performed;

a keyboard including a plurality of accompaniment keys;

chord designating means coupled to said keyboard for designating a chord in accordance with an operation of the accompaniment keys;

detecting means for detecting the same accompaniment keys which are operated continuously in a given measure and at least in a portion of a next successive measure;

read control means for reading out a bass pattern from said bass pattern memory means according to the designated chord by said chord designating means, and including a means for reading out repeatedly a predetermined measure of the at least one bass pattern when said detecting means detects that the same accompaniment keys are continuously operated in said given measure and at least in a portion of said next successive measure; and bass tone producing means for producing bass tones according to the bass pattern data read out by said reading control means.

4,561,339

MUSIC STAND FOR GUITAR PLAYER

Gary L. Jensen, E. 2410 - 29th, Spokane, Wash. 99203

Filed Mar. 5, 1984, Ser. No. 586,282

Int. Cl.⁴ G10D *3/00*

U.S. Cl. 84—453 **5 Claims**

1. In a music stand for guitar players having a base supporting an upright pedestal in turn supporting a music support in its upper part, the invention comprising, in combination:

a foot rest, adjustably supported by the lower portion of the music stand pedestal, having

a pedestal collar carried by the pedestal and hingeably communicating with a pedal, said pedestal collar adapted to support the foot of user and having

a depending foot structure to support the outer portion of the pedal at an adjustable distance above an underlying supporting surface.

4,561,340

TWO-BARREL REVOLVER-TYPE FIREARM

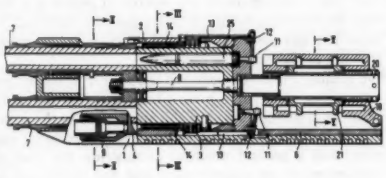
Roland Bertiller; Gerd Kellner, both of Schramberg, and Bernhard Peter, Rottweil, all of Fed. Rep. of Germany, assignors to Mauser-Werke Oberndorf GmbH, Fed. Rep. of Germany

Filed Oct. 11, 1983, Ser. No. 540,674

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1982, 3237728

Int. Cl.⁴ F41D *7/04*

U.S. Cl. 89—127 **11 Claims**



1. A multi-barrel revolver-type firearm, comprising:

a weapon housing;

two spaced apart barrels fixed to said housing, each barrel having a through bore for discharging a projectile;

a drum rotatably mounted in said housing having an odd number of axially extending equally circumferentially spaced cartridge chambers therein said cartridge chambers being distributed uniformly in a circle on said drum so that only a single cartridge chamber can be aligned with one of the through bores of said barrels at a time with rotation of said drum;

cartridge feed means connected to said housing for feeding a cartridge to each of said cartridge chambers;

ignition means connected to said housing and associated with each of said two barrels for igniting a cartridge disposed in a cartridge chamber aligned with a through bore of each respective one of said barrels, said ignition means for each barrel being operable independently of each other;

drum drive means connected to said housing and engaged with each of said barrels for rotating said drum only upon ignition of a cartridge in a specific cartridge chamber aligned with a through bore of one of said barrels at a time, said drum drive means associated with each of said ignition means for igniting a cartridge in the specific cartridge chamber, said drum drive means comprising a pair of indexing slides slidably mounted in said drum housing, one indexing slide operatively connected to each of said barrels, gas driver means connected to each slide for driving each indexing slide one at a time in alternating fashion, said indexing slides being positively connected to each other for reciprocal dependent and opposite motion so as to slide in alternating fashion.

4,561,341

HYDRAULIC CIRCUITRY FOR A BACKHOE

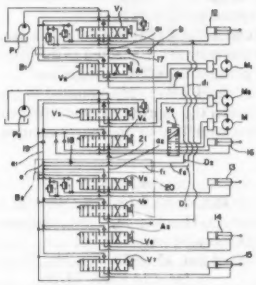
Norihiro Aikawa, Sakai, Japan, assignor to Kubota, Ltd., Japan

Continuation of Ser. No. 190,815, Sep. 25, 1980, abandoned. This application Oct. 25, 1983, Ser. No. 545,112

Claims priority, application Japan, Jul. 7, 1980, 55-95532

Int. Cl.⁴ F01B *25/02*

U.S. Cl. 91—6 **4 Claims**



1. A hydraulic circuitry for a backhoe or the like comprising a multiplex valve assembly provided with a first center bypass including at least one first and second control valve connected to a hydraulic cylinder for swinging a boom about a horizontal axis and to a hydraulic motor for driving one of two travelling members, the first and the second control valve being connected in parallel to each other to a first pump, and a second center bypass including at least one third to fifth control valve successively connected to a further hydraulic motor for driving another travelling member, a hydraulic motor for slewing a platform as well as a hydraulic cylinder for flexing and stretching a shovel arm, the third to a fifth control valve being connected in parallel to each other to a second pump and the fourth control valve being downstream of the third control valve and upstream of the fifth control valve; wherein

(a) the first control valve (V_1) is disposed upstream of the second control valve (V_2) relative to the first center bypass;

(b) a sixth control valve (V_6) for a hydraulic cylinder (**14**) for swinging a bucket (**11**) and a seventh control valve (V_7) for a hydraulic cylinder (**15**) for actuating a dozer (**7**) are additionally disposed within the second bypass (A_2);

(c) the sixth control valve (V_6), downstream of the fifth control valve (V_5) and upstream of the seventh control valve (V_7), is connected to these ones in parallel and to the second pump (P_2);

(d) a first block (B_1) is interposed between the first (V_1) and the second control valve (V_2);

(e) a second block (B_2) provided between the fourth (V_4) and the fifth control valve (V_5);

(f) a first confluence line (D_1) provided to connect a first center bypass portion (a1) included in the first block (B_1) to a parallel connection line portion (e) included in the second block (B_2), said first confluence line (D_1) being adapted to pass a portion of fluid from the first pump (P_1) therethrough into the second center bypass when the hydraulic motor of the first center bypass is brought into operation and also when the work elements of the first center bypass are all idle, first confluence lines (D^1) connecting to a connection line (e) so that a plurality of control valves in the second bypass receive a portion of fluid from the first pump (P^1);

(g) a second confluence line (D_2) provided to connect a downstream end of the first center bypass (a_1) to a second center bypass portion (a2) included in the second block (B_2) and to the parallel connection line portion (e) said second confluence line (D_2) being adapted to pass the remaining portion of fluid from the first pump (P_1) therethrough into the second center bypass when the work elements of the first center bypass are all idle;

(h) a check valve (17) mounted on the first confluence line (D_1) to prevent backflow of the first center bypass portion (a1);

(i) a further check valve (18) mounted on the second confluence line (D_2) between the second center bypass portion (a2) and the parallel connection line portion (e) in the second block (B_2) to prevent backflow to the second center bypass portion (a2);

(j) a third check valve (19) mounted on a parallel connection line portion (e or e1) connected to the fourth control valve (V_4) to prevent backflow therein; and

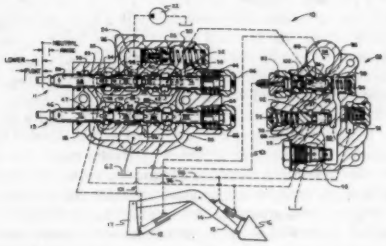
(k) a fourth check valve (21) mounted in the second bypass (A_2) between the fourth (V_4) and fifth control valve (V_5) to prevent backflow to the fourth control valve (V_4).

4,561,342

SERIES SELF-LEVELING VALVE

Robert W. Calvert, Hutchinson, Kans., assignor to The Cessna Aircraft Company, Wichita, Kans.

Filed Jul. 25, 1983, Ser. No. 517,177
Int. Cl.[4] F15B *13/06*
U.S. Cl. 91—31 **8 Claims**



1. A self-leveling system controlling a boom and bucket including boom and bucket double-acting cylinders controlled by separate boom and bucket directional control valves in an open center series circuit with the boom control valve having a float position located upstream of the bucket control valve, a pressure source supplying the valves in a series path across the open center path of each valve to reservoir, the improvement comprising:

a flow dividing valve means spring-biased in one direction connected to the rod end of the boom cylinder which splits the flow from the boom cylinder into two flow paths in a first position;

a first passage means connecting the first of said two flow paths with an end of the bucket cylinder so as to maintain the bucket in a level position as the boom raises;

a second passage means connecting the second of said two flow paths with a boom motor port whereby the bucket valve can be separately actuated concurrent with the boom valve, and the flow dividing valve having a second position bypassing all of the flow from the boom cylinder to the second passage means;

a separate servo means for positioning said flow dividing valve means in the first or second position;

a sensing line connecting the servo means to the head end of the boom cylinder whereby the servo means positions the flow dividing valve means in its second position under certain pressure levels in the head end of the boom cylinder.

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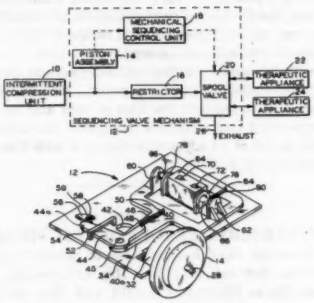
SEQUENCING VALVE MECHANISM

Thomas A. Mummert, Toledo, Ohio, assignor to Jobst Institute, Inc., Toledo, Ohio

Continuation of Ser. No. 296,988, Aug. 27, 1981, abandoned.
This application Apr. 19, 1985, Ser. No. 724,935
Int. Cl.[4] F15B *21/02*
U.S. Cl. 91—37 **15 Claims**



1. In an apparatus for applying intermittent pressure to a human limb including a source of a series of fluid pressure pulses and a pair of appliances responsive to the pulses for applying the pressure, a valve mechanism comprising:

piston means connected to the source of pulses and responsive to the application of the pulses for moving in one direction and responsive to the absence of the pulses for moving in the opposite direction;

valve means connected between the source of pulses and the appliances, said valve means having a first non-actuated position connecting one of the appliances to the source of pulses and the other one of the appliances to an exhaust port, and a second position connecting the one of the appliances to an exhaust port and the other one of the appliances to the source of pulses; and

sequencing means connected between said piston means and said valve means for actuating said valve means to said second position in response to alternate ones of the pulses supplied to said piston means, said sequencing means including a connecting rod attached to said piston means and a valve control member connected between said connecting rod and said valve means, said valve means including a spool valve having a plunger slidably received in a body, said plunger being actuated by said valve control member, said valve control member including a pair of actuation members for alternately engaging opposite ends of said plunger.

10. A sequencing valve mechanism for regulating the application of pressure from a source of pulses of pressure fluid to a pair of fluid actuated appliances comprising:

piston means responsive to the application of pressure fluid by a source for generating mechanical movement;

valve means for connecting the source to a pair of appliances, said valve means being normally connected to one of the appliances; and

valve control means responsive to the movement of said piston means for actuating said valve means whereby the source is connected to the other one of the appliances during alternate pulses of pressure fluid from the source said valve control means including a member, said member having a valve actuation portion in contact with said valve means and an extending arm connected to said piston means for actuating said valve means in response to the movement of said piston means, and ratchet means attached to said member for controlling movement of said piston means such that the source is connected to the other one of the appliances during alternate pulses of pressure from the source.

4,561,344

ELECTRO-FLUIDIC CONTROL DEVICE

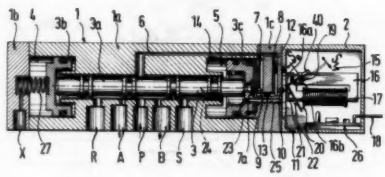
Harald Klocke, and Uwe H. Thomsen, both of Malente, Fed. Rep. of Germany, assignors to H. Kuhnke GmbH KG, Malente, Fed. Rep. of Germany

Filed Feb. 22, 1984, Ser. No. 582,523

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1983, 3306588

Int. Cl.⁴ F15B *13/16*

U.S. Cl. 91—358 A **9 Claims**



1. An electro-fluidic control device, comprising at least one fluidic control piston displaceable within a casing, the casing having at least one venting nozzle arranged to drive the control piston in one direction into a first operating position, and a closure device arranged to shut off the venting nozzle prior to movement of the control piston out of the first operating position, said closure device being at least partially displaced into a closed position by means of an electromagnet, the closure device is arranged to be held in the closed position by means of a permanent magnet coupled to said control piston, means for deenergizing said electromagnet once the closure device is closed, and means for resetting said electromagnet automatically during the displacement of the control piston to open the venting nozzle, said control piston breaking the magnetic coupling between the closure device and the permanent magnet.

4,561,345

PNEUMATIC SETTING DEVICE

Knud Blohm, and Hans P. B. Petersen, both of Nordborg, Denmark, assignors to Danfoss A/S, Nordborg, Denmark

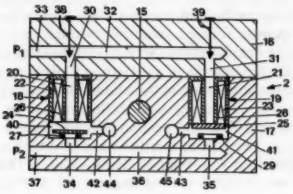
Continuation of Ser. No. 528,617, Sep. 1, 1983, abandoned. This application Oct. 25, 1984, Ser. No. 664,759

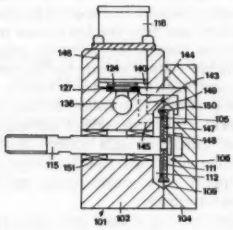
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1982, 3235015

Int. Cl.⁴ F15B *13/04*

U.S. Cl. 91—459 **1 Claim**

1. A pneumatic setting device comprising, expansible chamber means, a housing having pressure supply and exhaust passage means, a first solenoid valve unit in said housing including a solenoid coil forming a central unobstructed fluid passage substantially coextensive with the length and internal diameter of said solenoid coil, said first solenoid valve unit including a fluid distribution chamber axially adjacent said coil having aligned supply and exhaust ports with one of said ports being for said coil central fluid passage, said first solenoid valve unit including valve seats for said ports and an armature in the form of a flat disk shaped closure member fully contained in said distribution chamber which is reciprocatable between said valve seats, a second solenoid valve unit in said housing substantially similar to said first solenoid valve unit, said housing have passage means connecting said distribution chamber





supply and exhaust ports with said housing supply and exhaust passage means, said housing have a pair of control passages connectable to opposite sides of said expansible chamber means, said housing having passage means fluidly connecting said distribution chambers of said first and second solenoid units respectively to said control passages, and said first and second valve units being oppositely operable to connect said supply passage means to one of said control passages concomitant with connecting said exhaust passage means to the other of said control passages.

4,561,346

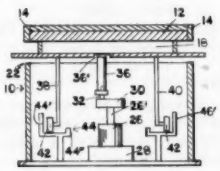
DEVICE FOR VIBRATING A DEEP FRYING PAN

Andre Marquer, 1721 Fisher Dr., Apt. 109, Oxnard, Calif. 93003

Filed Jul. 27, 1984, Ser. No. 635,053

Int. Cl.⁴ A47J *37/04*

U.S. Cl. 99—348 **8 Claims**



1. A device for vibrating a frying pan in order to evenly and thoroughly cook the contents thereof comprising:

a main frame;

first bracket runner means mounted by said main frame on one side thereof;

second bracket runner means mounted by said main frame on the other side thereof;

a frying pan support plate means for supporting thereon a frying pan in which food is cooked, said frying pan support plate means freely supporting a frying pan thereon for free uninhibited movement thereon within certain boundaries, said support plate means comprising a circumferential outer lip extending upwardly and away from said main frame, said outer lip limiting the extreme movement of a frying pan on said support plate means in all directions to provide limits to the movement of the frying pan;

heating means formed in said support plate means for movement therewith, said support plate means having at least one opening formed therethrough for mounting said at least one heating means so that said heating means moves with all movements of said support plate means;

roller means connected to the underside of said support plate means for mounting said roller means in a direction toward said first and second bracket runner means, in a direction away from the direction in which said outer lip projects; said roller means comprising a first roller element mounted to the underside of said support plate means for operative engagement in said first bracket runner means for movement along the length therealong, and a second roller element spaced from said first roller element the same distance said second bracket runner means is spaced from said first bracket runner means and in the same direction thereof for operative engagement in said second bracket runner means for movement along the length thereof; said roller means having means for connecting each of said first roller element and said second roller element to the underside of said support plate means so that movement of said roller elements along said bracket runner means will cause corresponding movement of said support plate means along the lengths of said bracket runner means;

said main frame having at least one upper opening through which extend said roller means for connection to the underside of said support plate means thereby for movement along said bracket runner means; said at least one opening of said main frame providing sufficient clearance to said support plate means to allow movement thereof by said roller means; and

drive means operatively connected to an underside of said support plate means and mounted in the interior of said main frame directly below said support plate means, said drive means comprising a motor having a drive shaft, a rotatable disc operatively connected to the drive shaft of said motor for rotating said disc, and lever means having a first end connected to said underside, and a second end below said first end connected to said disc; said disc comprising means for mounting said second end of said lever arm thereto, whereby said mounting plate is caused to have oscillatory movement along said bracket means.

4,561,347

PROCESSOR FOR CONTINUOUSLY COOKING GRAINS

Eizo Zaitu, Nara, Japan, assignor to Shinagawa Machinery Works Co., Ltd., Osaka, Japan

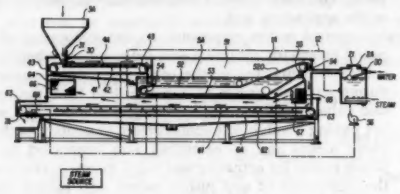
Filed May 29, 1984, Ser. No. 614,907

Claims priority, application Japan, Jun. 1, 1983, 58-098498

Int. Cl.⁴ A47J *37/12*

U.S. Cl. 99—352 **13 Claims**

1. A continuous type grain processor comprising a processor body and a tank for supplying hot water to the processor body; said processor body comprising a hopper for feeding the grains thereinto; a heating means, for heating the grains from the hopper, which is disposed under said hopper; a transport means for transporting said heated grains while bringing said grains into contact with said hot water from said tank; a steaming transport means for transporting said grains from said transport means while bringing said grains into contact with steam thereby steaming them and evaporating the excessive water on the surface of each grain particle; means for supplying steam to said steaming transporting means; and an outlet on a downstream end of



said steaming transport means, for discharging the resulting cooked grains.

4,561,348

APPARATUS FOR GRILLING MEAT OR THE LIKE

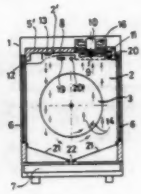
M. A. M. Halters, Bavel, and A. S. Verwijmeren, Prinsenbeek, both of Netherlands, assignors to Eurogrill B.V., Prinsenbeek, Netherlands

Filed Apr. 2, 1984, Ser. No. 595,903

Claims priority, application Netherlands, Sep. 7, 1983, 8303095

Int. Cl.⁴ A47J *37/04*

U.S. Cl. 99—421 H **2 Claims**



1. An apparatus for grilling food, suitable for continuous operation in commercial use, and of the type in which the food is mounted on a rotating pit inside a grilling chamber, but differing from prior grilling apparatus in that charring of liquid dripping and splattering from the food is very substantially reduced, said apparatus comprising:

walls, including an upper wall located above the food, and including lateral walls extending downward from the upper wall to a bottom, said walls and bottom collectively defining the grilling chamber;

a casing enclosing said walls but spaced from them;

an upper plate located within the grilling chamber adjacent and facing said upper wall but spaced from it;

a heating element located in the space between said upper wall and said upper plate, said upper plate shielding the food from radiation produced by said heating element, whereby excessive localized surface heating of the food is avoided;

a first fan located in the space between said upper plate and said upper wall for circulating the air within the grilling chamber first downwardly over the food, and then upwardly, and for causing a flow of air across said heating element for heating the air as it is recirculated, whereby cooking of the food is accomplished primarily by condution from the heated air rather than by radiation from said heating element;

a second fan located in the space between said casing and said walls and causing ambient air to flow through the space between said casing and said walls and carrying away heat from said walls, whereby said walls are cooled so that charring of liquids that splatter from the food onto said walls is substantially reduced;

a radiator element located in the grilling chamber above the food and producing radiation for browning the surface of the food, said radiator element being operated at relatively low power compared to said heating element since said radiator element is used merely for browning the surface of the food but is not relied on for cooking the interior of the food;

a fat collecting tray located on the bottom of the grilling chamber; and,

guide baffles extending from said lateral walls into the grilling chamber and sloping downward toward said fat collecting tray, and funneling into said fat collecting tray any liquids that drip from the food while it is cooking, said guide baffles shielding substantially all of said fat collecting tray from the radiation and hot air within the grilling chamber and further serving to guide the flow of recirculating air around the food, said guide baffles being partially shielded by the food from the radiation, thereby reducing charring of liquids that drip onto said guide baffles.

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VARIABLE LENGTH GUIDE DEVICE FOR A PUSHED WIRE

René E. Grenon, 21, rue Victor Hugo, 77181 Courtry, France

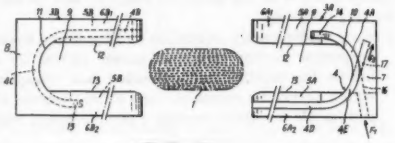
PCT No. PCT/FR84/00063, § 371 Date Nov. 13, 1984, § 102(e) Date Nov. 13, 1984, PCT Pub. No. WO84/03681, PCT Pub. Date Sep. 27, 1984

PCT Filed Mar. 15, 1984, Ser. No. 681,864

Claims priority, application France, Mar. 16, 1983, 83 04304

Int. Cl.⁴ B65B *13/04*

U.S. Cl. 100—26 **5 Claims**



1. A device for guiding a binder wire around articles to be bound, characterized in that it comprises a first portion (3A) having an internal face (5A), a second portion (3B) having an internal face (5B), a guide channel (4) hollowed out in said internal faces (5A, 5B), each portion (3A, 3B) having two parallel branches ($6A_1$, $6A_2$ and $6B_1$, $6B_2$ respectively) extending towards one another from two respective opposite junction zones (7, 8), said branches being capable of having their internal faces (5A, 5B) slide over each other and delimiting a central opening (9) having curved ends (10, 11) in the junction zones and straight sides (12, 13) in the parallel branches ($6A_1$ - $6A_2$ and $6B_1$ - $6B_2$), while the guide channel (4) is composed of successive lengths (4A to 4E) hollowed alternately in the internal face (5A) of one portion (3A) and then in the internal face (5B) of the other portion (3B) with connecting slopes (14, 15) between each internal face and the opposite internal face.

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SOFT DRINK CAN CRUSHER

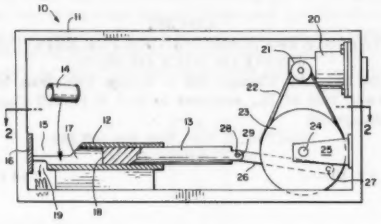
Felix C. Snoe, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of, New York, N.Y. 10007

Filed Sep. 22, 1983, Ser. No. 534,697

Int. Cl.⁴ B30B *9/32*

U.S. Cl. 100—98 R **2 Claims**

1. A soft drink can crusher, comprising in combination, a frame, a cylinder affixed on the frame, a piston slideable inside the cylinder, means for reciprocating said piston in said cylinder, an anvil at the end of said cylinder, said piston being forced by said means against a can placed in an end of said cylinder adjacent said anvil in further combination with means to cut said can in half, after the can has been crushed responsive to further piston reciprocation, wherein said piston is made of two piston members, each of which is aligned to bear against said can, and means whereby one said members is



moveable to a position further advanced against said can than the other, wherein the anvil includes a portion moveable to a position out of alignment with said piston when it is moveable to said position further advanced, including means for moving said anvil portion responsive to piston reciprocation.

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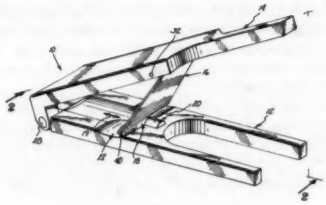
IMPLEMENT FOR FLATTENING CYLINDRICALLY SHAPED CONTAINERS

Vern L. Ader, 9352 Eisenhower, Marshfield, Wis. 54449

Continuation-in-part of Ser. No. 443,537, Jan. 18, 1983, abandoned. This application Apr. 13, 1984, Ser. No. 600,119

Int. Cl.⁴ B30B *9/32*

U.S. Cl. 100—233 **11 Claims**



1. A hand operated implement for flattening a crushable cylindrically shaped container having closure surfaces at both ends thereof, comprising:

frame means constructed and arranged for retaining a container on a first end thereof, the longitudinal axis of the container length being aligned with a longitudinal axis of the frame means;

handle means pivotally connected to the frame means adjacent the first end thereof, constructed and arranged for rotation from an open position angled at an acute angle to the longitudinal axis of the frame means, to a closed position generally parallel to the frame means and displaced therefrom by a distance substantially less than the diameter of the cylindrically shaped container to be crushed; and

pivot plate means with a fixed end and a free end, pivotally mounted by its fixed end to the handle means for rotation from a first position, acutely angled with respect to the handle means and perpendicularly disposed with respect to the frame means when the handle means is in an opened position, to a second position substantially flush with the handle means when the handle means has been rotated to its closed position, the pivot plate means being constructed and arranged for engaging and crushing inward, with its free end, a side wall of a cylindrical container

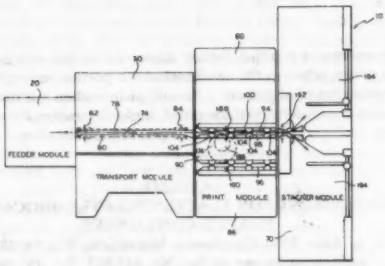
retained on the first end of the frame means, as the handle means is rotated from its opened position to its closed position, facilitating the folding of the container closure surfaces inward and the final flattening of the container by the handle means when fully rotated to its closed position.

4,561,352

ROTATABLE PRINT MECHANISM FOR PRINTING ON FRONT OR BACK OF MEDIA

Eduard Svyatsky, Chicago, and K. George Rabindran, Morton Grove, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Nov. 5, 1984, Ser. No. 668,140
Int. Cl.[4] B41F *13/24*
U.S. Cl. 101—2 **14 Claims**



1. A document printing system adapted to move documents serially past a print head for printing information on a printing surface of each document, said system comprising:

a table slidably mounted to a fixed support, said table being moveable laterally between first and second positions;

a first document receiving track on said table for moving said documents in a first path past said print head for printing on a first side of said document when said table is in said first position;

a second document receiving track on said table and disposed in spaced relation and parallel to said first document receiving track for moving said documents in a second path past said print head for printing on a second side of said document when said table is in said second position.

4,561,353

ENDLESS BAND HAND STAMP

Richard H. Chapman, Mitcham, and Bernard Sams, London, both of England, assignors to Pneumatic Rubber Stamp Co., Ltd., London, England

Filed Jan. 8, 1985, Ser. No. 689,784
Claims priority, application United Kingdom, Jan. 17, 1984, 84 01165; Jul. 25, 1984, 84 20215
Int. Cl.[4] B41J *1/20*
U.S. Cl. 101—111 **16 Claims**

1. A rubber stamp comprising a housing

a base plate fixedly attached to one end of said housing and having an aperture therethrough;

a handle mounted at the other end of said housing;

a stamp block including:

a plurality of independently changeable stamp elements made of rubber and projecting through an said aperture in said plate,

said stamp elements being arranged on a plurality of endless rubber bands rotatably mounted parallel with each other on a common frame in said housing,

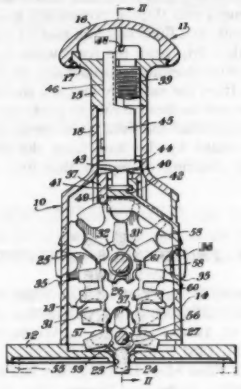
said common frame being connected to said handle for movement therewith in a direction normal to said base plate;

means for withdrawing said stamp block through said aperture in said base plate into the interior of said housing;

means for changing said stamp elements on said stamp block within said housing from outside thereof,

said means for changing comprising a plurality of wheels projecting through respective slots in a wall of said housing,

each said wheel having a plurality of peripheral recesses and being rotatable to rotate one of said rubber bands; and



means for locking each said wheel against rotation when said stamp block is in the stamping position, said means for locking including

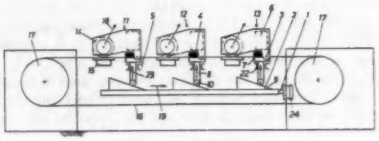
a frame saddle loosely carried on said frame and having a projection thereon, and cam means carried by said handle for moving said projection into engagement with a peripheral recess on each of said wheels when said handle is rotated through a predetermined angle.

4,561,354

MULTIPLE UNIT APPARATUS FOR THE TREATMENT OF WEBS OF MATERIAL

Josef Glantschnig, Wölfnitz, and Peter Gugl, Klagenfurt, both of Austria, assignors to Johannes Zimmer, Klagenfurt, Austria

Filed Oct. 5, 1984, Ser. No. 658,131
Claims priority, application Austria, Oct. 6, 1983, 3557/83
Int. Cl.[4] B41L *13/06*
U.S. Cl. 101—120 **7 Claims**



1. An apparatus for the treatment of a web of material which comprises:

means defining a substantially horizontal transport path for a web of material;

a plurality of treatment drums spaced apart along said path for successively treating each area of said web as said web is displaced along said path;

respective holders rotatably receiving said drums and disposed above said path;

respective carriers spaced apart in the direction of said path, each of said holders being pivotally connected to a respective one of said carriers, said carriers each having a respective extension;

respective wedges having inclined ramp surfaces engaging said extensions;

a common actuating member connected to all of said wedges for simultaneously displacing same to vertically adjust the positions of all of said carriers in common; and

an individually controllable element associated with each holder for tilting same with reference to the respective carrier.

4,561,355

DEVICE FOR FIXING A PLATE ON A CYLINDER

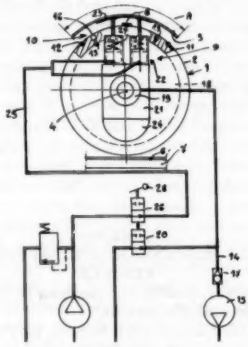
Jean P. Cuir, 36 Av de Brigode, and Gérard Cuir, 23 Allée des Champs, both of 59650 Villeneuve D'ASCQ, France

Continuation of Ser. No. 496,582, May 20, 1983, abandoned. This application Feb. 28, 1985, Ser. No. 706,894

Claims priority, application France, May 27, 1982, 82 09702

Int. Cl.⁴ B41F *27/06*

U.S. Cl. 101—378 **11 Claims**



1. A device for mounting a plate (3) on a cylinder (11), said device permitting the quick application and fixation of said plate (3) on a particular angular portion of said cylinder and, said device also permitting the disengagement of said plate from the cylinder (1), said device comprising two shaft ends (4) by which said cylinder (1) is guided and driven into rotation about an axis (5), said device including positioning means (9) operable to move the plate (3) toward the cylinder (1) and away from the cylinder (1), said positioning means comprising two hubs (21), each hub being mounted on one of the shaft ends (4) of the cylinder (1) and being free to rotate at least over an angular range relative to the cylinder, and at least one flange support (23) connected on one side to at least one of said hubs (21), through at least one arm (22) of adjustable length for securing one end of the plate (3), said device also including means (10) for fully applying on the cylinder both the median portion and the ends of the plate, said means for applying including a hollow cavity (18) within said cylinder forming a chamber disposed between orifices (13) formed in the cylinder and a circuit (14) of a vacuum pump (15), said circuit being equipped with a check valve (17) and connected to a directional control valve (20) which enables said circuit to discharge into the atmosphere.

4,561,356

EXPLOSIVE CHARGE SAFE-ARMING SYSTEM

Ernesto E. Bordon, Houston, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed Aug. 29, 1983, Ser. No. 527,062

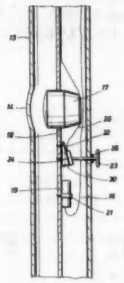
Int. Cl.⁴ F42C *15/00;* **E21B** *43/116*

U.S. Cl. 102—202.1 **10 Claims**

1. An explosive charge safe-arming system for a perforating gun comprising a shaped charge carrier, a support within said carrier, a detonating cord having a force receiving end and at least one shaped charge attached to said detonating cord and activated thereby, said safe-arming system comprising:

a blasting cap having a force transmitting end and configured to generate a directional explosive force capable of actuating said detonating cord, said blasting cap for rigidly mounting within said perforating gun to said support for said at least one shaped charge such that the direction of said explosive force is fixed in relation to said support;

a leaf spring biasing means for movably mounting the force receiving end of said detonating cord adjacent to the force



transmitting end of said blasting cap and movable by lateral displacement into and out of alignment with the direction of travel of said explosive force; and,

arming means for penetrating said shaped charge carrier and contacting said leaf spring biasing means, said arming means being movable to alter the alignment of the force receiving end of the detonating cord with the direction of travel of said explosive force, whereby actuation of said detonating cord by said blasting cap can be prevented in a non-aligned position and permitted in an aligned position.

4,561,357

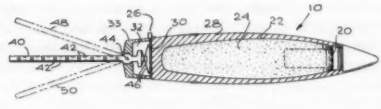
STEERING MECHANISM FOR AN EXPLOSIVELY FIRED PROJECTILE

Inge Maudal, Huntington Beach; Byron M. Niemeier, Claremont, and Larry D. Wedertz, Mira Loma, all of Calif., assignors to General Dynamics Pomona Division, Pomona, Calif.

Filed Sep. 15, 1982, Ser. No. 418,142

Int. Cl.⁴ F41G *9/00;* **F42B** *13/02, 15/00*

U.S. Cl. 102—439 **11 Claims**



1. A cartridge which includes a projectile having a guidance mechanism incorporated therein and a powder charge for firing the projectile, said cartridge comprising:

a projectile and a shell casing joined together as two separable portions;

a powder charge contained in said shell casing and surrounding a portion of said projectile, the firing of said powder charge causing said projectile to be expelled from the shell casing;

an antenna mounted on said projectile for receiving signals from a remote transmitter; and

course correcting means affixed to the projectile, said course correcting means comprising an elongated member extending rearwardly from said projectile into said powder charge and being selectively deflectable relative to the longitudinal axis of said projectile;

said course correcting means further comprising drive

means coupled to control the deflection of the elongated member in the air stream formed rearwardly of said projectile in order to steer said projectile in response to signals received from the remote transmitter.

4,561,358

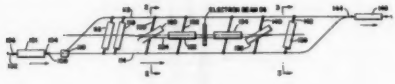
APPARATUS FOR CONVEYING ARTICLES THROUGH AN IRRADIATION BEAM

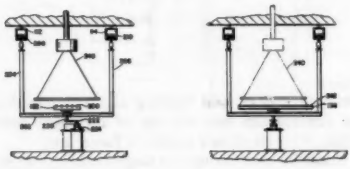
Robert G. Burgess, Smithtown, N.Y., assignor to Radiation Dynamics, Inc., Melville, N.Y.

Filed Jul. 5, 1983, Ser. No. 510,722

Int. Cl.[4] B61B *3/00*

U.S. Cl. 104—89 **20 Claims**





1. Apparatus for conveying articles through an irradiation beam having a width B to irradiate the articles, the apparatus comprising;

a. a suspension member for supporting a carrier, said suspension means having a length L which substantially exceeds the beam width B,

b. a carrier for carrying at least one article to be irradiated, said carrier being pivotally connected to said suspension member and adapted to rotate relative thereto,

c. means for guiding and conveying said suspension means along a selected path which intersects the irradiation beam at a given angle relative to the plane of scan of the beam, said last mentioned means being connected to said suspension member and including a means permitting the suspension member to be reoriented relative to its direction of travel along the path, and

d. means for pivoting said carrier relative to said suspension member to change the angle between said plane and said carrier to an angle lying between said plane and said given angle.

4,561,359

OVERHEAD CONVEYOR SYSTEMS

Edward Duce, Leeds, England, assignor to Stockrail Services Limited, Gomersal, England

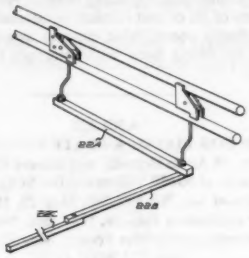
Filed Nov. 10, 1983, Ser. No. 551,665

Claims priority, application United Kingdom, Nov. 11, 1982, 8232232

Int. Cl.[4] E61B *3/00*

U.S. Cl. 104—94 **16 Claims**

12. In or for a trolley for an overhead suspension system comprising a pair of vertically spaced parallel guide rails, a roller head which is for swivelable connection to a suspension bracket, said roller head comprising three rollers arranged with their axes parallel and at the corners of the triangle formed thereby having a long side and two shorter sides, the roller head being insertable laterally between the guide rails when the long side of the triangle is parallel to the rails, but being locked to the rails when the roller head is under load performing its supporting function, and two of the rollers run



on the lower rail, the third roller engaging the underside of the upper rail.

4,561,360

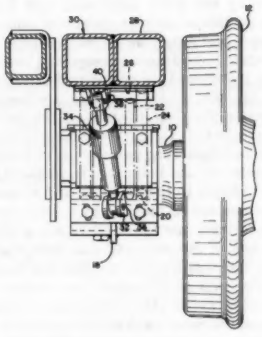
SINGLE AXLE SUSPENSION SYSTEM FOR RAILROAD VEHICLE

Harry W. Mulcahy, Griffith, Ind., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed Jun. 6, 1984, Ser. No. 617,752

Int. Cl.[4] B61F *3/00*

U.S. Cl. 105—199 S **5 Claims**

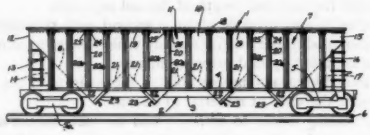


1. In a railway vehicle, a vehicle body, a wheel and axle assembly having a journal box with spaced wings extending longitudinally of the body beyond said axle, spring seats on respective wings disposed longitudinally of the body beyond said axle at opposite sides thereof, spring means on said seats for supporting said body to accommodate relative lateral, longitudinal, vertical, yaw, pitch and roll movement between said assembly and said body, brackets on respective wings, said seats being disposed between said brackets, brackets on said body above respective wing brackets and aligned therewith, each wing bracket being disposed laterally of its related body bracket, and a single axial displacement damper connected diagonally to each wing bracket and the body bracket thereabove to damp such movement.

4,561,361
MOUNTING FOR THE TOP CHORDS OF THE SIDES OF A RAILROAD HOPPER CAR

Norman S. Adams, Cincinnati, Ohio, assignor to Ortner Freight Car Company, Milford, Ohio

Filed Mar. 12, 1984, Ser. No. 588,370
Int. Cl.[4] B61D *17/00*
U.S. Cl. 105—406 R 22 Claims



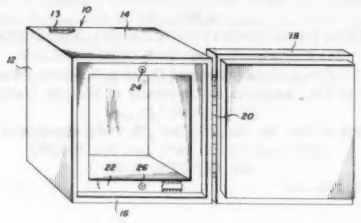
1. Top side chord attachment for an open-top, bottom-discharge railroad car of the type having sides each comprising a longitudinally extending vertically oriented side sheet with upper and lower edges, a bottom chord, a top chord and a plurality of side posts, said side sheet being affixed at its lower edge to said bottom chord and at its upper edge by fasteners to said top chord, each of said side posts having upper and lower ends and longitudinally extending lateral flanges to either side thereof, said side posts being arranged vertically along the exterior of said side sheet in parallel spaced relationship, each of said side posts being affixed at its lower end to said bottom chord, along said lateral flanges to said side sheet, and at its upper end by fasteners to said side sheet and said top chord, said top chord comprising a beam-like member extending substantially the length of said side sheet and having a horizontal portion terminating at its longitudinal in-board edge in a downwardly depending in-board leg lying along the inside surface of said upper edge of said side sheet, a pair of mirror image gussets located to either side of each side post at said upper end thereof, the upper edge of said side sheet and the upper ends of said side posts being spaced from said horizontal portion of said top chord, said gussets having upper edges abutting said horizontal portion of said top chord, each gusset of each side post having a first portion overlying the adjacent one of said side post flanges and a second portion overlying the adjacent portion of said side sheet, said first gusset portion having an upper fastener passing therethrough and through said adjacent side post flange, said side sheet and said in-board top chord leg in double shear and at least one lower fastener below said upper fastener passing through said first gusset portion, said adjacent side post flange and said side sheet in single shear, said second gusset portion having at least one upper fastener passing therethrough and through said side sheet and said in-board top chord leg in double shear whereby to strengthen said top side chord assembly.

4,561,362
MOBILE-IMMOBILE SAFE

Wallace P. Wildermuth, Box 888, Lead, S. Dak. 57754

Filed Jun. 18, 1980, Ser. No. 160,734
Int. Cl.[4] E05G *1/02*
U.S. Cl. 109—81 2 Claims

1. A container for safe-keeping valuables and adapted to be selectively rendered relatively heavy and consequently relatively immobile and relatively light and consequently relatively portable, said container comprising a casing having inner and outer spaced-apart walls and a lockable door for providing access to a storage space within the casing when the door is open and for sealing the inside of the casing against access when the door is closed, the space between the inner and outer walls holding a removable mass of solid weight means, including a plurality of metal weights, sufficient to render the container relatively immobile, said door in its closed position blocking access to said solid weights means and in its open position permitting access to said solid weight means so

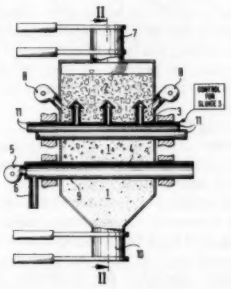


that the latter may be removed to reduce the weight of the container and render the same relatively portable.

4,561,363
METHOD AND CHAMBER FOR COMBUSTION OF EFFLUENT GASES FROM THE PYROLYSIS OF COMBUSTIBLE MATERIAL

Heinz Mallek, Linnich-Tetz, Fed. Rep. of Germany, assignor to Kernforschungsanlage Jülich GmbH, Jülich, Fed. Rep. of Germany

Filed Apr. 4, 1984, Ser. No. 596,678
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1983, 3312863
Int. Cl.[4] F23G *5/00*
U.S. Cl. 110—229 20 Claims



1. Method of burning up material which is at least in large part combustible comprising the steps of pyrolyzing said combustible material and burning it with admission of air in quantities insufficient for complete combustion to produce combustible gases at least part of which are not ignited by the burning material, and then leading said combustible gases to a combustion chamber in which they are mixed with air and then burned at a temperature higher than the temperature of the pyrolyzing step,

the step of burning said combustible gases at said higher temperature in said combustion chamber being performed by providing a first admission of air into said combustion chamber (1) for partial combustion of said gases in said combustion chamber at a temperature not exceeding 800° C. and by leading said gases from said combustion chamber (1) into a gas duct (4) which is open to the interior of said combustion chamber (1) to an extent adequate for passage of said gases into said duct, and then leading said gases in said duct, separately from the remainder still in said combustion chamber, away from said combustion chamber through a portion thereof while feeding fresh air into said duct for mixing with said gases and for supporting their combustion in said duct at a temperature therein

rising above 800° C. as said gases proceed in said duct on their way out of said combustion chamber.

4,561,364

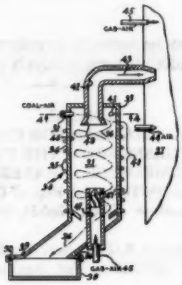
METHOD OF RETROFITTING AN OIL-FIRED BOILER TO USE COAL AND GAS COMBUSTION

Alex E. S. Green, Gainesville, and Bruce A. S. Green, Micanopy, both of Fla., assignors to University of Florida, Gainesville, Fla.

Division of Ser. No. 306,177, Sep. 28, 1981, abandoned. This application Jun. 2, 1983, Ser. No. 500,392

Int. Cl.⁴ F23O *1/00*

U.S. Cl. 110—347 **19 Claims**



1. A method of retrofitting an existing oil-fired boiler to burn coal and natural gas to achieve the normal power densities and/or SO_2 levels of said boiler when burning oil and maintaining manageable ash levels therefrom comprising the steps of:

(A) determining the type of coal based upon the percent of sulfur and the percent of ash which is to be used in a pulverized state to form a generally homogenous fuel mixture;

(B) selecting from among:

(1) direct coal-water slurry injection and combustion apparatus for low sulfur and low ash contents, and high fusion temperature coals,

(2) first indirect coal-water slurry injection and combustion apparatus for moderate sulfur and high ash contents, and high fusion temperature coals, and

(3) second indirect coal-water slurry injection and combustion apparatus for moderate sulfur and high ash contents, and low fusion temperature coals;

(C) installing the selected injection and combustion apparatus on said existing oil-fired boiler;

(D) installing natural combustible gas injection in said combustion apparatus;

(E) injecting said coal-water slurry under pressure in a tangentially swirling path; and

(F) injecting said gas under pressure with air in a apirally swirling path within the path of said coal-water slurry with the motion of said gas reinforcing the motion of said coalwater slurry to enhance the more complete combustion thereof.

4,561,365

APPARATUS FOR FORMING CUT SEGMENTS OF A SELECTED LENGTH WITH AT LEAST ONE FOLDED END

Volker Schmidt, 4638 Todds Rd., Lexington, Ky. 40509, and Erich A. Schmidt, 2415 Liberty Rd., Lexington, Ky. 40505

Filed Jan. 28, 1983, Ser. No. 462,032

Int. Cl.⁴ D05B *23/00*

U.S. Cl. 112—121.27 **30 Claims**

1. An apparatus for forming a segment cut from a strip of material with at least one end of the cut segment folded including:

cutting means to cut a segment of a selected length from the strip of material;

feed means to feed the strip of material a first selected distance along a first path past said cutting means;

gripping means to grip the strip of material after it has been fed past said cutting means the first selected distance by said feed means to pull the strip of material a second selected distance along the first path past said cutting means so that the sum of the first and second distances equals the selected length of the cut segment;

movable means movable along a second path substantially orthogonal to the first path along which the strip of material is pulled by said gripping means;

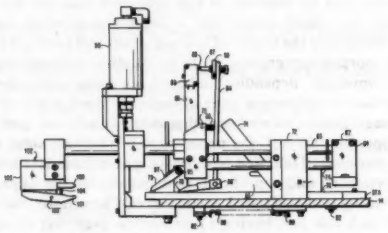
said movable means having holding means to hold the portion of the strip of material to be cut;

reciprocating means to advance said movable means along the second path to a first position in which said holding means holds the portion of the strip of material to be cut;

first rendering means to render said holding means effective to hold the portion of the strip of material to be cut when said cutting means cuts the strip of material to produce a cut segment held by said holding means;

folding means to fold the cut segment held by said holding means to form a loop at at least one end of the cut segment;

second rendering means to render said gripping means ineffective after said cutting means has cut the strip of material to form the cut segment and prior to said folding means being effective;



said reciprocating means advancing said movable means from the first position along the second path to a second position at which the folded cut segment is to be attached to other material after being retained at the second position;

said first rendering means rendering said holding means ineffective after the folded cut segment has been retained at the second position;

and said reciprocating means retracting said movable means along the second path to a third position more remote from the second position than the first position after said holding means has been rendered ineffective.

30. An apparatus for holding a cut segment of a selected length for positioning at a position at which the cut segment is to be attached to other material including:

support means;

clamping means supported by said support means to clamp a portion of a strip of material to be cut prior to the strip of material being cut to produce a cut segment of a selected length, said clamping means clamping the portion of the strip of material imtermediate the ends of the cut segment to be produced from the strip of material;

means to mount said support means for reciprocating movement along a path substantially orthogonal to the strip of material to be cut to produce the cut segment to be clamped by said clamping means;

and means to cause reciprocating movement of said support means along the path from a first position at which the cut segment is produced from the strip of material by cutting

to a second position at which the cut segment is to be attached to other material, from the second position to a third position more remote from the second position than the first position, and from the third position to the first position.

4,561,366

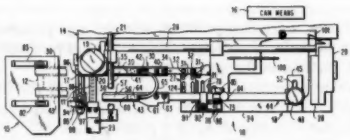
APPARATUS FOR HOLDING A CUT SEGMENT OF A SELECTED LENGTH

Volker Schmidt, 4638 Todds Rd., Lexington, Ky. 40509, and Erich A. Schmidt, 2415 Liberty Rd., Lexington, Ky. 40505

Filed Mar. 13, 1984, Ser. No. 589,494

Int. Cl.[4] D05B *3/12, 35/00*

U.S. Cl. 112—121.27 **19 Claims**



1. An apparatus for holding a cut segment of a selected length and forming a loop in the cut segment including:

support means;

two separate clamping means supported by said support means for movement with said support means to clamp separate portions of a strip of material to be cut before cutting or when the strip of material is cut to produce a cut segment of a selected length, said two separate clamping means clamping the separate portions of the strip of material intermediate the ends of the cut segment to be produced from the strip of material;

means to mount said support means for reciprocating movement along a path substantially orthogonal to the strip of material that is to be cut to produce the cut segment to be clamped by said two separate clamping means;

means to cause reciprocating movement of said support means along the path from a first position at which the cut segment is produced from the strip of material by cutting and said two separate clamping means clamp the cut segment to a second position at which the cut segment is to be attached to other material by the cut segment being retained for attachment to the other material prior to said two separate clamping means ceasing to clamp the cut segment, from the second position to a third position more remote from the second position than the first position to enable positioning of the strip of material prior to said two separate clamping means being positioned for clamping separate portions of the strip of material, and from the third position to the first position;

and reducing means to reduce the distance between said two separate clamping means at least from where said two separate clamping means clamp the cut segment and before said support means is disposed at the second position so that the cut segment has a loop of a selected length formed between said two separate clamping means when said support means is at the second position.

4,561,367

LOCKSTITCH SEWING MACHINE

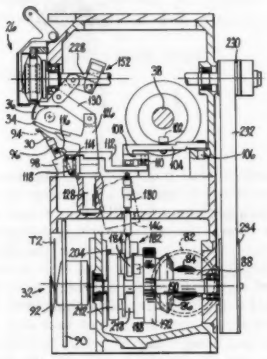
John Corbett, Aspley Guise; Edric M. E. Brown, Milton Keynes; Peter N. Tapner, Twickenham, and David J. Commander, Milton Keynes, all of England, assignors to USM Corporation, Farmington, Conn.

Filed Sep. 7, 1984, Ser. No. 648,657

Claims priority, application United Kingdom, Sep. 8, 1983, 8324063

Int. Cl.[4] D05B *15/08*

U.S. Cl. 112—38 **12 Claims**



1. A lockstitch sewing machine comprising a worktable and a presser foot arranged at an operating locality of the machine for clamping a workpiece therebetween and for feeding such workpiece step-by-step through the operating locality;

a mounting for a curved hooked needle and a further mounting for a curved awl arranged in a common vertical plane and at opposite sides of the worktable, at the operating locality of the machine, and mounted for pivotal movement about a common axis,

means for looping thread over the needle hook, after the latter has penetrated a workpiece being stitched and while it is projecting therethrough, retraction of the needle then causing the loop of thread to be drawn through the workpiece,

means, including a rotatable shuttle, by which a lockstitch can be formed with said thread and a further thread, and

means for thereafter drawing the lockstitch thus formed into the body of the workpiece, wherein the needle mounting and the awl mounting are caused to pivot each by a crank mechanism,

and further wherein the mechanisms are mounted on a common crank shaft and each is operatively connected to its associated mounting through a bell crank lever arrangement, said arrangements being mounted on a common pivot arranged intermediate the crank shaft and the common axis of the mountings for the needle and awl.

4,561,368

SEWING MACHINE HAVING THE NEEDLE HOLDER MAGAZINE WITH AUTOMATIC COUPLING AND DECOUPLING OF THREAD CONTAINING NEEDLES AND NEEDLE HOLDERS

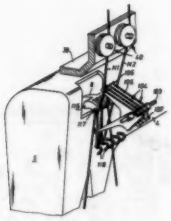
Erich Willenbacher, Kaiserslautern, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Division of Ser. No. 589,493, Mar. 14, 1984. This application Jun. 13, 1985, Ser. No. 744,418

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1983, 3309509

Int. Cl.[4] D05B *49/00*

U.S. Cl. 112—241 **3 Claims**



1. A needle thread guide for a sewing machine having a reciprocatable needle bar and a magazine for needle holders each of which contains a needle having thread which is drawn off from a supply thereof, comprising a stop plate mounted adjacent said needle bar and having a plurality of alternately arranged needle support sectors and slots defined along a top face thereof, a guide finger for a thread supply for each needle adjacent said stop plate, a thread catching lever for each needle holder pivotally mounted adjacent said stop plate and said guide finger and being engageable in an operative position with a respective one of said sectors and with the thread fed for the operating needle from each thread supply being engageable in a non-operative position in a respective slot which lies out of the path of movement of the associated needle thread.

2. A needle thread guide for guiding a plurality of needle thread supplies into association with a take-up lever which is movable on a sewing machine before the thread is delivered to a thread guide needle, comprising a stop plate mounted for movement and having a plurality of alternately arranged needle support sectors and slots defined along a top face thereof, a guide finger for thread supply for each thread arranged alongside said stop plate, a thread catching lever for each needle holder mounted adjacent said stop plate and said guide finger and being engageable in an operative position on a respective one of said sectors and with the thread fed to the operating needle for each thread supply and being engageable in a non-operating position in a respective slot in a position in which is lies out of the path of movement of its associated needle thread, and means for shifting said thread catching levers relative to said plate.

4,561,369

SEWN PATTERN ARRANGEMENT TO BE PRODUCED BY A ZIG ZAG SEWING MACHINE

Günter Meier, Karlsruhe-Durlach, Fed. Rep. of Germany, assignor to Dorina Nähmaschinen GmbH, Fed. Rep. of Germany

Filed Sep. 16, 1983, Ser. No. 532,830

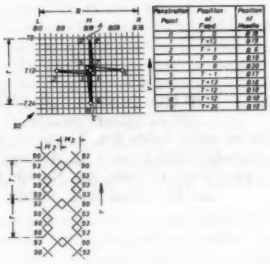
Claims priority, application Fed. Rep. of Germany, Sep. 21, 1982, 3234864

Int. Cl.[4] D05C *17/00;* **D05B** *3/02*

U.S. Cl. 112—266.1 **13 Claims**

1. A method of stitching a combined pattern from a group of patterns wherein each pattern in the combined pattern is connected directly to an adjacent pattern without jump stitches between patterns, and using a zig zag sewing machine having a needle mounted to execute lateral bight movement within a maximum bight width and a feed member mounted to execute longitudinal feed motion, comprising:

selecting a plurality of patterns for the group of patterns which each lie in a rectangular area and include a plurality of stitches which form at least one cross-stitch having a cross point with legs extending by equal amounts from the cross point, stitches in each pattern forming said cross stitch lying at 90° with respect to each other and the width of said rectangular area for each pattern being an integer fraction of the maximum bight width, each pattern having a starting and a final needle perforation point which are spaced apart in the longitudinal direction by a longitudinal width of the rectangular area, a starting point of at least some patterns in the group of patterns corresponding to a final point of at least some patterns in the group of patterns;



establishing a sequence of permissible patterns for the combined pattern wherein each pattern in the sequence has a final point corresponding to a starting point of a preceding pattern in the sequence; and

stitching the combined pattern using a plurality of the patterns within the group of patterns and observing the established sequence, the combined pattern being stitched to include some patterns which are staggered with respect to each other in the longitudinal direction and at least some patterns which are parallel to each other in the longitudinal direction.

4,561,370

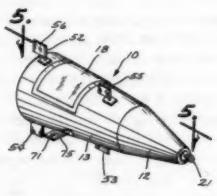
RECREATIONAL WATERCRAFT

William D. Sanford, R.R. #1, Story City, Iowa 50248

Filed Jun. 25, 1984, Ser. No. 624,236

Int. Cl.[4] B63B *1/04, 39/06;* **B63H** *25/06*

U.S. Cl. 114—56 **13 Claims**



1. A recreational watercraft comprising:

a housing;

seating means disposed in said housing for supporting a person;

control means attached to said housing for guiding said watercraft through the water comprising:

a first generally vertically disposed shaft rotatably attached to a forward portion of said housing;

a first bottom rudder means disposed on one side of said first

shaft for affecting the movement of said watercraft as it moves through the water;

a first top rudder means disposed on the other end of said first vertical shaft for affecting the movement of said watercraft as it moves through the water;

a second generally vertically disposed shaft rotatably attached to a rear portion of said housing;

a second bottom rudder means disposed on one end of said second shaft for affecting the movement of said watercraft as it moves through the water;

a second top rudder means disposed on one end of said second vertical shaft for affecting the movement of said watercraft as it moves through the water;

foot engageable means operably attached to a lower portion of said first shaft for selectively rotating said first shaft in one direction or the other;

interconnecting means operably attached to said foot engageable means and to the second shaft for moving the second shaft proportionally in an opposite direction to the movement of the first rudder means thereby permitting rapid turning of said housing in the water upon actuation of the control means , said interconnecting means including a first horizontally disposed cantilever member connected to said first vertical shaft, a second horizontally disposed canitlever member connected to said second vertical shaft, and cable means connected to said first and second cantilever members for causing one of said cantilever members to move in one direction when said other cantilever member is moved in the other direction;

means for connecting said foot engageable means to said first horizontally disposed cantilever member, said foot engageable means extending to both sides of said first shaft at all times so it can be engaged by both feet of a person within the housing;

conduit means connected to each inner side of the housing for guiding said cable means around the seating means from one of said cantilever means to the other;

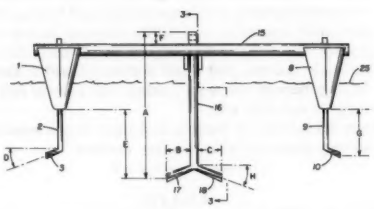
door means for selectively opening said housing for access or closing said housing for use; and

ballast means for insuring that said door means will be on top of said watercraft when the watercraft is stopped.

4,561,371
CATAMARAN STABILIZATION STRUCTURE

Richard L. Kelley, 39 Roosevelt St., and Frederick W. Holbrow, 25 Congress St., both of, Braintree, Mass. 02184

Filed Jul. 16, 1984, Ser. No. 631,543
Int. Cl.[4] B63H *9/00*
U.S. Cl. 114—61 **2 Claims**



1. In a catamaran sailboat with a bow and stern that includes a pair of laterally spaced parallel hulls and interconnecting bracing and decking secured to said hulls, a catamaran stabilization structure comprising:

a longitudinal opening in the decking intermediately disposed between the hulls having a forward end and an aft end corresponding to the bow and stern respectively;

a centerboard, protruding through said longitudinal opening, having a deck end which terminates in a handle and is positioned above the decking, and a water end which terminates in a double wing stabilizer approximately perpendicular to the centerboard and positioned beneath the water surface which stabilizer wings are slightly swept back from the bow in the direction of the stern and are rippled from bow to stern;

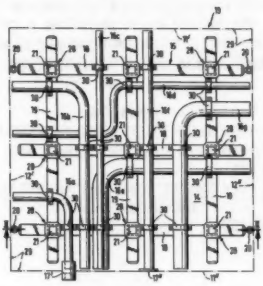
a pair of dagger-boards each of which protrudes through a hull; and

a plurality of various sized wedges for adjusting the pitch of the centerboard stabilizer which are inserted forward and aft of the centerboard deck end within the centerboard deck opening.

4,561,372
SHIP WITH A PIPING SYSTEM ARRANGED ON AN INNER DECK

Hans-Joachim Franz, Kölln-Reisiek; Karl-Otto Sadler, Hamburg, and Willi Schmidt, Ellerbek, all of Fed. Rep. of Germany, assignors to Blohm & Voss AG, Hamburg, Fed. Rep. of Germany

Filed Feb. 16, 1984, Ser. No. 580,613
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1983, 3305323
Int. Cl.[4] B63B *25/08*
U.S. Cl. 114—74 R **44 Claims**



19. A ship with at least one piping system arranged on a deck having a mounting surface located in the interior of the ship for the conveying of fluids, the piping system comprising a plurality of subdivided individual piping units which are assembled at predetermined intervals selectively in the longitudinal and lateral directions along vertical lateral and longitudinal dividing planes, said piping units being disposed on removable pallets located on said mounting surface, open ends of corresponding pipes of adjacent piping units being arranged on vertical dividing planes, the piping system including removable pipe connectors for fluid-tight connection of corresponding mating pipes of adjacent piping units in assembly.

4,561,373
PROTECTIVE CAPS FOR SAILBOAT SPREADERS

John Hackney, 1026 NW. 16th St., Stuart, Fla. 33494

Filed Apr. 19, 1984, Ser. No. 602,138
Int. Cl.[4] B63H *9/10*
U.S. Cl. 114—89 **3 Claims**

1. A protective cap for the end of a sailboat spreader which comprises:

an opening in the rear of said cap of a size such that said cap will fit snugly over said spreader end,

an arcuate surface on the front of said cap,

a first slot in one side of said cap that extends from the outer surface of said cap into said opening,

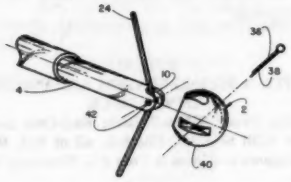
a second slot in the side of said cap opposite to said first slot, said second slot extending from the outer surface of said cap into said opening, the longitudinal axes of said first and second slots being aligned,

said first and second slots providing a space into which a

shroud carried on the end of said spreader may enter so said cap may fit over the end of said spreader,

a first bore through a side of said cap that extends from the outer surface of said cap into said opening, the longitudinal axis of said first bore being normal to said longitudinal axes of said slots,

a second bore through a side of said cap that extends from



the outer surface of said cap into said opening, the longitudinal axis of said second bore being normal to said longitudinal axes of said slots and aligned with said longitudinal axis of said first bore, and

a chamfer on the outer end of said second bore,

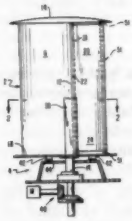
said first and second bores providing a passage through which a cotter pin may be inserted and retained by expanding the legs of said cotter pin in said chamfer.

4,561,374

WIND SHIP PROPULSION SYSTEM

Gunnar C. F. Asker, c/o Asker Enterprises, 60 E. 42nd St., New York, N.Y. 10165

Filed Sep. 23, 1983, Ser. No. 535,363
Int. Cl.[4] B63H *9/10*
U.S. Cl. 114—103 **6 Claims**



1. A sailing rig for a ship, comprising

a vertical mast,

a rigid unjointed mainsail section contoured to provide a pair of rearwardly tapering external airfoil surfaces having their leading edges disposed adjacent to said mast, said surfaces curving towards each other and forming a convex and substantially semicylindrical curve as the mainsail section's leading surface between said leading edges of said pair of airfoil surfaces,

a rigid jibsail section contoured to provide a pair of forwardly tapering external airfoil surfaces and having their trailing edges disposed in substantially coplanar relation with the leading edges of said mainsail section, there being between said trailing edges a concave and substantially semicylindrical curved trailing surface, complementally contoured to the leading surface of the mainsail section and fitting so closely thereto as to form an effective airseal between said mainsail and jibsail sections,

means permitting conjoint rotative displacement of said mainsail and jibsail sections through 360° relative to the ship, and

means for rotatably displacing said jibsail section about an axis essentially parallel to said mast through a sector of predetermined extent relative to said mainsail section,

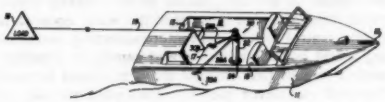
said airfoil surfaces of said mainsail and jibsail sections being complementally contoured to provide a composite smoothly curved essentially continuous airfoil surface on the leeward side of said assemblage and a relatively flat composite surface on the windward side thereof, independent of the angular position of said jibsail section relative to said mainsail section.

4,561,375

TOW APPARATUS AND METHOD OF INSTALLATION

Harold G. Paxton, 71901 Sorrento Pl., Richmond, Va. 23233

Filed Jan. 11, 1985, Ser. No. 690,542
Int. Cl.[4] B63B *21/56*
U.S. Cl. 114—253 **10 Claims**



1. Tow apparatus installable in a movable craft for towing a load situated behind said craft, said craft having at least one interior surface including an essentially planar portion thereof, said apparatus comprising:

an essentially vertical post member adapted to have means connectable to said load secured thereto;

means for anchoring said vertical post member to a planar portion associated with one of said interior surfaces;

at least one support member having an upper end thereof connectable to said vertical post member proximate the top of said vertical post member; and,

means for anchoring said support member to a planar portion associated with one of said interior surfaces, said support member anchoring means comprising:

footing means, said footing means comprising a footing plate and two footing walls perpendicular thereto, said walls extending from one side of said plate to form a channel therebetween, said footing means being insertable into a complementary shaped aperture in said planar portion of said interior surface in a manner whereby said footing plate abuts said planar portion and said footing walls extend into said aperture; ankle means, said ankle means being positionable in at least a storage position and a utility position, said ankle means in said storage position being essentially entirely accommodated in said footing channel, said ankle means in said utility position having a distal portion thereof extending beyond said footing plate and at an angle thereto, said distal portion of said ankle means having thereon means for mating with a lower end of said support member; and,

means for selectively moving said ankle means between said storage position and said utility position.

4,561,376

TRANSPORTABLE PONTOON

James P. Fitzgerald-Smith, Ossemsley, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

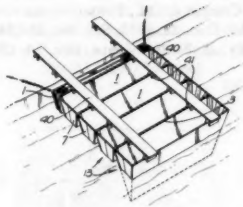
PCT No. PCT/GB83/00193, § 371 Date Apr. 18, 1984, § 102(e) Date Apr. 18, 1984, PCT Pub. No. WO84/00731, PCT Pub. Date Mar. 1, 1984
PCT Filed Aug. 4, 1983, Ser. No. 604,656
Int. Cl.[4] B63B *35/36*
U.S. Cl. 114—267 **9 Claims**

1. A transportable pontoon comprising:

a plurality of substantially planar hull members each having

a (1) keel edge, (2) a gunwale edge, substantially parallel to said keel edge, and (3) at least two bulkhead edges;

hinging means for hinging said members in sealed relationship at alternately conjoined keel edges and gunwale edges so as to fold in concertina fashion, thus allowing said pontoon to be substantially uniplanar when folded; and



bulkhead member means extending in sealed relationship between each inwardly folding pair of hull members, for defining with said hull members a sequence of open top, hollow parallel hulls each having a triangular cross-section when said pontoon is extended.

4,561,377

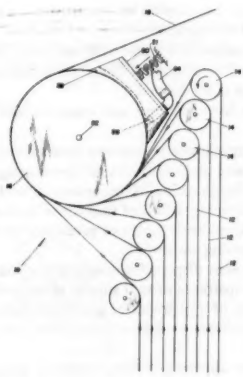
APPARATUS FOR COATING FIBER MATERIALS WITH RESIN

Dean Youngkeit, Willard, Utah, assignor to Morton Thiokol, Inc., Chicago, Ill.

Division of Ser. No. 504,634, Jun. 15, 1983, Pat. No. 4,530,855. This application Aug. 9, 1984, Ser. No. 622,907

Int. Cl.⁴ B05C *1/12, 11/10*

U.S. Cl. 118—33 **6 Claims**



1. Apparatus for coating fiber materials with resin comprising,

a plurality of positioning rollers having axes of rotation which are all parallel,

a rotatable drive roller applicator having an axis of rotation that is parallel to the axes of rotation of said positioning rollers,

each of said plurality of positioning rollers being positioned adjacent said drive roller applicator and being adapted for having a fiber individual thereto pulled under tension thereof and dircted thereby tangentially to the surface of said drive roller applicator, said positioning rollers being positioned in a substantially evenly spaced relationship on a line that is parallel to a tangent to the to the curvature of the adjacent surface of said drive roller applicator,

said drive roller applicator being operative to gather fibers looped around a substantial portion of the circumference thereof into a fibrous band as the fibers are pulled under tension over a substantial portion of the circumference thereof, and

means for depositing resin under pressure on a surface of said drive roller applicator that is opposite to the portion of the circumference thereof about which the fibrous band is pulled,

said means for depositing resin to the surface of the drive roller applicator including a spring loaded applicator block in sealing contact with the surface of said roller applicator, said block having orifices therein facing the surface of said roller applicator and from which resin is adapted to issue for even distribution thereon, and pumping means connecting said orifices to a source of resin under pressure.

4,561,378

COATING APPARATUS

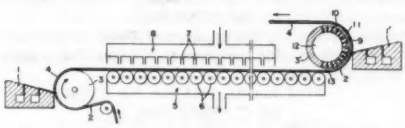
Takeshi Kishido; Tetsuya Yoshino, both of Hachioji; Takashi Kageyama, Hino, and Kazuo Kato, Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jun. 20, 1983, Ser. No. 505,708

Claims priority, application Japan, Jun. 22, 1982, 57-106136

Int. Cl.⁴ B05C *5/02, 13/00*

U.S. Cl. 118—62 **5 Claims**



1. A coating apparatus having a coater and a gas jetting device disposed to oppose to each other across a continuously running support, so that the coating is made by said coater while said support is carried in a non-contacting manner by a gas jetted from said gas jetting device towards said support, characterized in that said gas jetting device has a hollow housing into which the gas is introduced from a gas source at a pressure of between 0.1 and 5 Kg/cm^2, a portion of the wall of said housing adjacent to said support being curved and defining a non-contact carrying region of high static pressure and provided with a plurality of spaced-apart gas jetting nozzle ports through which said gas is jetted towards said support, each gas jetting nozzle port having a throat portion of predetermined length and presenting a minimum cross-sectional area inwardly spaced from the outer surface of said wall of said housing and an enlarged outlet portion of a length less than said predetermined length and presenting a comparatively large cross-section area opening in said surface of said wall, said minimum cross-sectional area being equivalent to that of a circular area having a diameter ranging between 0.02 and 0.5 mm and said maximum cross-sectional area being equivalent to that of a circular area having a diameter ranging between 0.5 and 5 mm.

4,561,379

PAPER FORMING

Ronnie A. Arav, Bolton, England, assignor to Beloit Corporation, Beloit, Wis.

Filed Mar. 12, 1984, Ser. No. 588,361

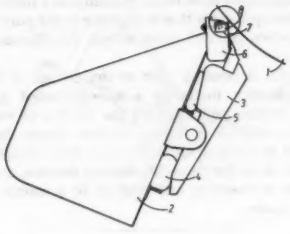
Claims priority, application United Kingdom, Apr. 8, 1983, 8309530

Int. Cl.⁴ B05C *11/04*

U.S. Cl. 118—126 **2 Claims**

1. Apparatus for supporting a coater blade comprising a

blade support, clamping means for locating the coater blade against the blade support, a profile support including a plate-like member clamped adjacent one edge thereof leaving another edge projecting to engage the coater blade transversely therealong, mounting means comprising a mounting bar secured to the blade support, and a clamp bar securing the profile



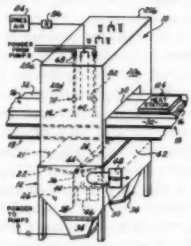
support to the mounting bar at one end thereof, said mounting means including a plurality of adjusting means comprising a plurality of screws, each, of which engages the profile support and mounting means to bias a corresponding portion of the profile support engaging the coater blade tangentially inwardly or outwardly along the extension of the blade surface relative to the tip edge of the blade.

4,561,380

METHOD AND APPARATUS FOR POWDER COATING A MOVING WEB

Douglas C. Mulder, Wellington, and David E. O'Ryan, Avon Lake, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio 44001

Filed Jun. 21, 1984, Ser. No. 622,963
Int. Cl.[4] B05B *7/06, 7/14*
U.S. Cl. 118—688 **31 Claims**



1. A powder spray system for applying solid particulate powder to a conveyorized fiber web of material, which system comprises,

a powder spray booth having a spray chamber defined at least in part by side walls and a bottom wall,

an opening in at least two of said side walls,

a conveyor passing through said openings in said side walls, said conveyor being adapted to transport a web of fiber material supported thereon through said booth,

powder recovery means including a powder recovery chamber located beneath said bottom wall of said booth,

at least one powder spray gun for spraying solid particulate powder upon said web of material, said spray gun comprising,

a tubular barrel having an inlet end and a discharge end,

means for connecting said inlet end to a source of air entrained powder,

a nozzle on the discharge end of said barrel, and

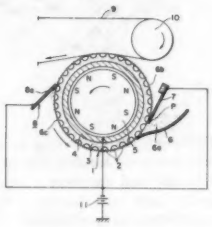
air flow amplifier means connected to said barrel for drawing ambient air into said air flow amplifier means and for impacting said air entrained powder with a high velocity air stream in the course of passage of said air entrained powder through said gun.

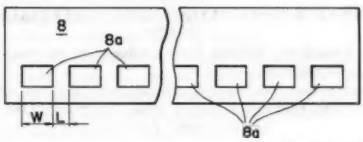
4,561,381

VOLTAGE-CONTROLLED DEVELOPING DEVICE

Toshio Kaneko; Koji Sakamoto, both of Tokyo; Fuchio Kanno, and Wataru Yasuda, both of Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 21, 1983, Ser. No. 564,245
Claims priority, application Japan, Dec. 24, 1982, 57-225973
Int. Cl.[4] G03G *15/06*
U.S. Cl. 118—652 **9 Claims**





1. A device for developing an electrostatic latent image by applying toner thereto, comprising:

transporting means for transporting said toner along a predetermined path including a developing region where said latent image is developed;

supply means for supplying said toner to said transporting means;

toner film forming means disposed downstream of said supply means and upstream of said developing region with respect to the direction of movement of said transporting means for forming a film of said toner having a predetermined thickness and charge of predetermined polarity on said transporting means;

discharging means disposed downstream of said developing region and upstream of said supply means with respect to the direction of movement of said transporting means for removing residual charge at least from said transporting means; and

bias means for applying a predetermined potential to said transporting means and said discharging means thereby maintaining said transporting means and said discharging means substantially at the same potential.

4,561,382

VACUUM VAPOR DEPOSITION GUN ASSEMBLY

Joseph D. Zeren, Boulder, Colo., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 22, 1983, Ser. No. 554,414
Int. Cl.[4] C23C *14/30*
U.S. Cl. 118—727 **9 Claims**

1. A vacuum vapor deposition gun assembly comprising:

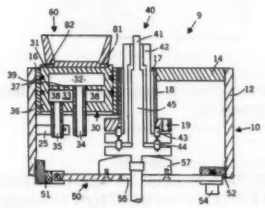
a hollow body having a cylindrical outer surface and an end

plate perpendicular to and fastened across one end of said surface;

a heat sink having a cylindrical outer surface and a crucible support plate perpendicular to and fastened across one end of said surface;

means for mounting said heat sink within a first orifice in said end plate with said support plate parallel to said end plate, said means providing a vacuum seal between said body and said sink;

a gun for providing a source of electrons for evaporating material to be deposited, said gun having a first cylindrical outer surface and a tip at one end of said surface;



means for rigidly mounting said gun within a second orifice in said body end plate, said means providing a vacuum seal between said body and said gun;

crucible means for holding material to be deposited, the bottom of said crucible contacting said crucible support plate;

a plurality of magnet means fastened to said body end plate for directing the gun output into said crucible; and

shutter means affixed to said body for selectively covering or uncovering said crucible, thereby permitting control over release of deposition material.

4,561,383

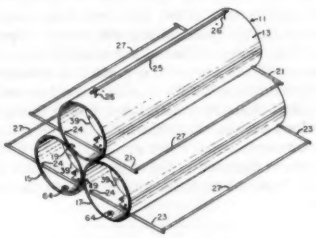
BIRDHOUSE WITH CYLINDRICAL COMPARTMENTS

Doyle A. Tidwell, 621 Cedar La., Fort Smith, Ark. 72903

Filed Aug. 9, 1984, Ser. No. 639,010

Int. Cl.⁴ A01K *31/00*

U.S. Cl. 119—23 **7 Claims**



1. A multiple compartment bird house comprising

at least three cylindrical tubes from 4 to 8 inches in diameter at least 6 inches long,

means for connecting said tubes in a fixed array with at least two of said tubes in mutual peripheral contact,

a plurality of wall elements of generally circular shape, at least some of said wall elements having a hole therein serving as an entrance opening,

fastening means for removably fastening said wall elements in said tubes spaced within 3 inches of the end thereof, and

horizontal perch rails secured near at least some of the ends of said tubes.

4,561,384

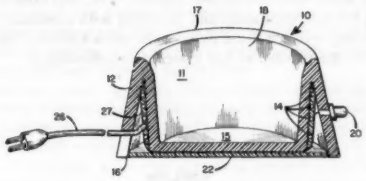
ANIMAL WATERING APPARATUS

Walter H. Liff, New Castle, N.H.

Filed Oct. 18, 1984, Ser. No. 662,365

Int. Cl.⁴ A01K *7/00*

U.S. Cl. 119—73 **6 Claims**



1. A temperature controlled domestic animal watering device comprising:

(a) a molded plastic container having:

(1) an inner wall defining a closed bottom, sidewalls and an open top;

(2) an outer wall integrally joined to said inner wall at said top and extending below said closed bottom spaced outward of said inner wall to define an open bottom below said closed bottom;

(b) an electrical resistance heating element in contact with said inner wall consisting of negative temperature coefficient of conductivity heating cable; and,

(c) means to connect said heating element to a source of electrical energy, said heating element providing increasing electrical energy as the ambient temperature falls below the freezing temperature of water.

4,561,385

FLUIDIZED BED SHELL BOILERS

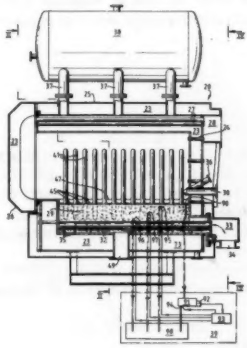
Henry F. Cross, Rickmansworth, and Maurice Harman, Bletchley, both of England, assignors to The Energy Equipment Company, Ltd., Bedfordshire, England

Filed Dec. 20, 1983, Ser. No. 563,313

Claims priority, application United Kingdom, Dec. 21, 1982, 8236259; Feb. 17, 1983, 8304426; Feb. 17, 1983, 8304427; Aug. 2, 1983, 8320818

Int. Cl.⁴ F22B *1/00*

U.S. Cl. 122—4 D **16 Claims**



1. A shell boiler comprising a furnace tube which is generally circular in cross-section and is surrounded by a water jacket, a bed within said furnace tube of inert particulate material, means for feeding said bed with gas to fluidize said bed and support combustion of fuel fed thereto, walls provided within

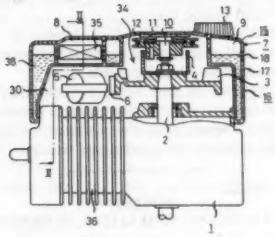
said furnace tube to bound the fluidized bed, at least those portions of said walls contacting the bed being disposed substantially vertically, such that the maximum width of the bed is less than the maximum width of the volume of the furnace tube above the fluidized bed therein, at least two of said walls bounding the fluidized bed include hollow water tubes piercing the wall of the furnace tube and communicating with the water jacket surrounding said furnace tube, said hollow water tubes being spaced apart and provided with conductive webs extending between those parts of the tubes adjacent the bed to prevent the passage of bed material therebetween.

4,561,386

FAN HOUSING FOR ENGINE

Shinichi Tamba, and Noboru Fukui, both of Kakogawa, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan

Filed Dec. 19, 1984, Ser. No. 683,504
Claims priority, application Japan, Dec. 20, 1983, 58-241707
Int. Cl.⁴ F01P *1/02*; A01D *53/08*
U.S. Cl. 123—41.7 **2 Claims**



1. A fan housing to cover an engine cooling fan mounted on an engine output shaft, which is of a double wall construction around an engine cooling air passage, with the inner space of the double wall serving as a fuel tank, wherein said cooling air intake passage is made up of a nearly circular cylindrical wall which extends in the direction of the engine output shaft and terminates integrally into the outer and inner walls of the fan housing at both ends, as well as wherein a recoil starter is directly installed concentrically with the engine output shaft.

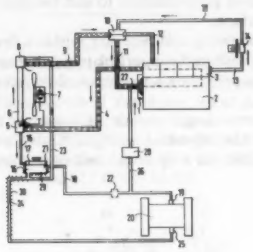
4,561,387

LIQUID COOLING SYSTEM FOR A TURBOCHARGED INTERNAL COMBUSTION ENGINE

Hans Körkemeier, Achern; Walter Martschik, Unterriexingen, and Josef Klieber, Löchgau, all of Fed. Rep. of Germany, assignors to Dr. Ing.h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 9, 1984, Ser. No. 639,089
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1984, 3407521
Int. Cl.⁴ F01P *3/12*
U.S. Cl. 123—41.31 **20 Claims**

1. A liquid cooling system for an internal combustion engine supercharged by a turbocharger, comprising forced circulation means effected by pump pressure, a radiator having an inlet and outlet, the turbocharger being operatively connected with the forced circulation between the radiator and the internal combustion engine, the turbocharger together with a geodetically higher heat exchanger, an inlet line means and a return line means forming a further cooling circulation which is maintained by thermo-syphoning action after the internal combustion engine is turned off.

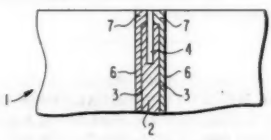


4,561,388

CYLINDER BLOCK FOR AN AIR-COMPRESSING INTERNAL COMBUSTION ENGINE

Dietrich Gwinner, Winnenden; Roland Merkle, Stuttgart, and Friedrich Noltemeyer, Wailblingen-Hohenacker, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Dec. 11, 1978, Ser. No. 968,177
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1977, 2756120
Int. Cl.⁴ F02F *1/14*; F02B *75/18*
U.S. Cl. 123—41.74 **10 Claims**



1. A cylinder block for an internal combustion engine, the cylinder block comprising a plurality of cylinders, dry liner means disposed in each of the cylinders, each of the dry liner means have a flange, and cooling slot means disposed in the cylinder block between two adjacent cylinders, the cooling slot means start from a separating plane to a cylinder head and are in communication with a cooling water circulation means of the engine, characterized in that a wall thickness of the cylinder block between the adjacent cylinders is dimensioned such that circumferential outer surfaces of the flanges of the dry liner means disposed in the adjacent cylinders extend in a direction at least substantially tangentially to the the cooling slot means.

4,561,389

ENGINE OPERATION CONTROL MEANS FOR SUPPRESSING ROUGH ENGINE OPERATIONS

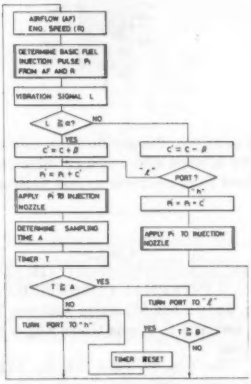
Tokuichi Matsumoto, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Continuation of Ser. No. 488,616, Apr. 25, 1983, abandoned. This application Feb. 4, 1985, Ser. No. 697,438
Claims priority, application Japan, Apr. 26, 1982, 57-70028
Int. Cl.⁴ G01L *23/22*; F02M *25/06*; F02P *5/04*
U.S. Cl. 123—425 **12 Claims**

1. An engine operation control system comprising:
(a) vibration detecting means for detecting low frequency engine vibrations representative of engine roughness, and for providing an engine roughness signal;

(b) engine intake mixture control means responsive to said engine roughness signal for controlling at least one intake mixture parameter affecting engine combustion in a manner to avoid misfiring and for providing a control output signal for a predetermined time period;

(c) actuator means responsive to said control output signal for continuously controlling said intake mixture parameter in a direction which avoids engine roughness due to misfiring;



(d) engine speed sensing means to provide an engine speed signal;

(e) said intake mixture control means detecting when said engine speed reaches a predetermined value and subsequently adjusting said actuator means at a more rapid rate when said predetermined value is exceeded in order to minimize overcontrol by said intake mixture control means.

4,561,390

VARIABLE VALVE-TIMING APPARATUS IN AN INTERNAL COMBUSTION ENGINE

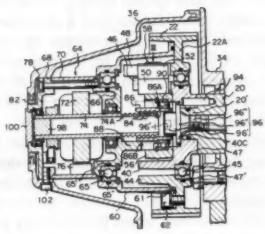
Norihiko Nakamura, Mishima; Toyokazu Baika; Yoshiaki Shibata, both of Susono, and Toshio Miki, Yao, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota and Koyo Seiko Kabushiki Kaisha, Osaka, both of, Japan

Continuation of Ser. No. 544,712, Oct. 24, 1983, abandoned. This application Jun. 4, 1985, Ser. No. 741,038

Claims priority, application Japan, Nov. 12, 1982, 57-197803

Int. Cl.[4] F01L *1/34*

U.S. Cl. 123—90.15 **6 Claims**



1. A sealed assembly for controllably adjusting an angular relation between a drive source and a camshaft of an internal combustion engine, the assembly comprising:

an annular casing having a first open end and a second open end;

an annular power transmitting member having a sleeve portion extending coaxially inside the casing toward the second end thereof;

first connection means sealingly affixing the power transmitting member to the first end of the casing;

an inner sleeve member disposed coaxially inside the sleeve portion of the power transmitting member, the inner sleeve member and the sleeve portion of the power transmitting member each having a longitudinally extending slit, angled one relative to the other;

a bearing means rotatably and sealingly connecting the power transmitting member to the inner sleeve member;

a motor unit having an enclosed housing and an open tubular drive shaft rotatably mounted in the housing, the drive shaft including a first end extending through a first end of the motor housing and a second end accessible through a second end of the housing, opposite the first end therof;

second connection means for rotatably and sealingly mounting the motor housing at the second end of the casing such that the first end of the motor shaft extends toward the first end of the casing coaxially with the inner and outer sleeves;

means for coupling the one end of the motor shaft to the inner sleeve member and the power transmitting member for controllably adjusting the angular relation between the power transmitting member and the inner sleeve member in response to predetermined angular rotation of the motor shaft with respect to the housing;

a captive fastener retained by the inner sleeve member and disposed coaxially with the motor shaft, the fastener being accessible through the open tubular shaft of the motor for mounting and demounting the sealed assembly on the end of the camshaft; and

means for closing the second end of the tubular motor shaft to prevent loss of lubricant inserted through the shaft into the sealed casing to lubricate the abutment means.

4,561,391

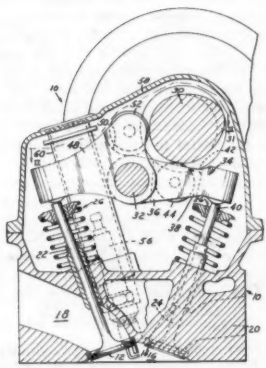
FOUR VALVE FOR CYLINDER ENGINE WITH SINGLE OVERHEAD CAMSHAFT

Aladar O. Simko, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 4, 1985, Ser. No. 719,942

Int. Cl.[4] F01L *1/02*

U.S. Cl. 123—90.27 **4 Claims**



1. A valve train construction for a small cylinder bore engine having four valves per cylinder each angled with respect to one another and a centrally located spark plug, comprising a single high position overhead engine driven camshaft having

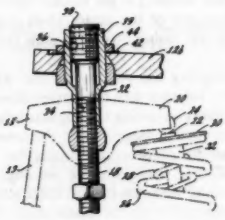
an axis of rotation offset laterally with respect to a vertical plane containing the engine cylinder centerline, a single centrally located rocker arm shaft positioned beneath the camshaft on the engine cylinder centerline, and a plurality of rocker arm means pivotally mounted on the shaft and operatively engagable individually each with one of the valves for successively actuating the same upon rotation of the camshaft, the spark plug projecting to the cylinder bore center in a clearance space defined between a pair of the rocker arms and axially adjacent valves beneath the rocker arm shaft.

4,561,392

GIRDLE ASSEMBLY FOR STUD MOUNTED ROCKER ARMS

Paul M. Jette, Pasadena, Calif., assignor to Del West Engineering, Inc., Chatsworth, Calif.

Filed Sep. 10, 1984, Ser. No. 649,229
Int. Cl.[4] F01L *1/22*
U.S. Cl. 123—90.43 **4 Claims**



3. A girdle assembly for supporting a set of at least three rocker arm studs as a unitary structure for distribution of vibrations therebetween comprising, a rocker arm barrel threaded internally and screwed into place on each stud to adjust valve lash, said barrel having adjustment nut portion at its upper end, a locking stud engaging the barrel interior to its upper end and terminating in an surface adapted to lie in contact with the top of said rocker arm stud, a ball nut threadedly engaging the barrel and having a nut portion on its bottom end and an upwardly facing ball portion on its top forming a surface of a frustrum, a girdle bar means, said girdle bar means having holes therethrough for passing the upper end of said studs and barrels, each of said holes opening downwardly into a recess thereabout which mates with the surface of the frustrum of said respective ball nut, said ball nuts, when adjusted, defining a plane within which said girdle bar means is evenly supported, nut and washer means threadedly engaging the upper end of said barrel nut whereby the ball and barrel nut when taken up firmly and directly grip the upper and lower surface of said girdle, means forming a flat on the upper side of said girdle and surrounding each said hole, said barrel nut and washer clamping the interposed grid plate from its upper and lower surfaces in compression resisted by the tension forces developed in the barrel nut and substantially normal to the plane of the girdle bar means.

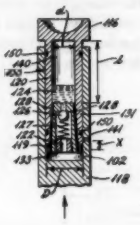
4,561,393

SEALED UNIT FOR HYDRAULIC LIFTER

Howard J. Kopel, Rte. 2, Box 13, Hooker, Okla. 73945

Continuation-in-part of Ser. No. 384,276, Jun. 2, 1982, Pat. No. 4,466,280. This application Jun. 13, 1984, Ser. No. 620,338
Int. Cl.[4] F01L *1/14, 1/24*
U.S. Cl. 123—90.48 **3 Claims**

1. A valve lifter assembly comprising a cylinder and a piston-shell assembly, said assembly comprising an enclosed unobstructed reservoir chamber, a pressure chamber and hydraulic fluid in said chambers, one portion of said piston-shell assembly slidably fitting in said pressure chamber, a metering orifice between and connecting said reservoir chamber and said pressure chamber, a one-way valve between and permitting fluid flow from said reservoir chamber to said pressure chamber, and a void space in said reservoir chamber directly above the hydraulic fluid reservoir therein, said void space containing a



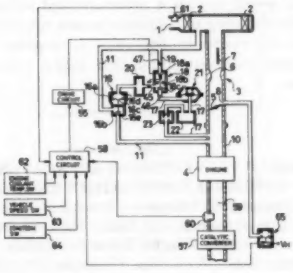
pressurized inert gas, the gas pressure directly generating all force thereby to open said one-way valve and permit flow of hydraulic fluid from reservoir to said pressure chamber.

4,561,394

AIR INTAKE SIDE SECONDARY AIR SUPPLY SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Eiji Kishida, Tokyo, and Masahiko Asakura, Tokorozawa, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 19, 1984, Ser. No. 652,189
Claims priority, application Japan, Sep. 20, 1983, 58-145251[U]
Int. Cl.[4] F02M *1/02, 23/10*
U.S. Cl. 123—179 G **4 Claims**



1. An air intake side secondary air supply system for an internal combustion engine equipped with a choke valve whose opening angle varies as the engine warms up and is arranged to close when the engine is cold so as to provide a rich mixture, and a fast idle system having a cam mechanism linked with the choke valve for varying a minimum opening angle of a throttle valve as the engine warms up, comprising:

an air-fuel ratio detection means for detecting an air-fuel ratio from a composition of an exhaust gas of the engine and producing an air-fuel ratio detection signal indicative of the result of the detection of air-fuel ratio;

an air intake side secondary air supply means for suppyling secondary air on the downstream side of said throttle valve in accordance with the content of said air-fuel ratio detection signal;

an operating state detection means for detecting a predetermined operating state in which said throttle valve is opened by means of said fast idle system, and producing an operating state detection signal; and

a control means for suspending the supply of the secondary air on the downstream side of said throttle valve upon

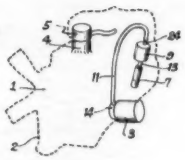
presence of said operating state detection signal, thereby controlling the air-fuel ratio to a rich side.

4,561,395

AUXILIARY OIL FILTRATION SYSTEM

Tod McMullen, 8036 Linda Vista Rd., #2F, San Diego, Calif. 92111

Filed Jun. 25, 1984, Ser. No. 624,016
Int. Cl.⁴ B01D *27/10*
U.S. Cl. 123—196 A **6 Claims**



1. An auxiliary filter system for diverting and filtering a portion of the normal oil flow of an engine having an oil dipstick tube for checking the engine oil level, the auxiliary filter system comprising:

an secondary filter unit having an oil inlet and an oil outlet, said secondary filter unit comprising a housing and a filter element mounted in said housing, said housing being formed at least partially of transparent material such the the interior of said housing is visible;

means for diverting a portion of the normal oil flow of the engine to the filter unit inlet; and

means for connecting said filter unit outlet in an upright orientation to said oil dipstick tube, said connecting means comprising a tube projecting from said unit outlet for insertion into said oil dipstick tube.

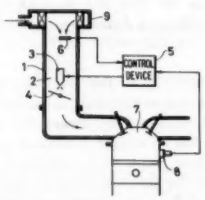
4,561,396

FUEL CONTROL APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Yoshiyuki Sakamoto, and Seiji Wataya, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 455,636, Jan. 5, 1983, abandoned. This application Aug. 14, 1984, Ser. No. 640,249
Claims priority, application Japan, Jan. 14, 1982, 57-5624
Int. Cl.⁴ F02B *77/00*; F02M *51/08*
U.S. Cl. 123—198 E **4 Claims**

PRIOR ART



1. A fuel control apparatus for an internal combustion engine having an air intake tube rigidly attached to said air intake tube providing fluid communication between an air cleaner and said engine and having disposed therein a throttle valve, comprising:

an electrically controlled fuel injection valve;

a control device for controlling said fuel injection valve in accordance with various parameters of said engine, said control device including a radiating fin on one end surface of said control device for removing heat from heat-generating elements which drive said fuel injection valve; and

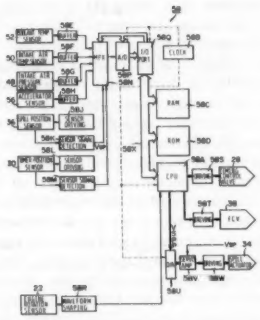
means for mounting said control device on said air intake tube to directly fix said control device on said intake tube between said air cleaner and said engine, so that said radiating fin is cooled by incoming air conveyed in said air intake tube.

4,561,397

METHOD OF CONTROLLING INDIVIDUAL CYLINDER FUEL INJECTION QUANTITIES IN ELECTRONICALLY CONTROLLED DIESEL ENGINE AND DEVICE THEREFOR

Keisuk Tsukamoto, Nagoya; Masaomi Nagase, and Kiyotaka Matsuno, both of Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Feb. 14, 1985, Ser. No. 701,628
Claims priority, application Japan, Mar. 2, 1984, 59-41060
Int. Cl.⁴ F02D *1/04*
U.S. Cl. 123—357 **6 Claims**



1. A method of controlling individual cylinder fuel injection quantities in an electronically controlled diesel engine, wherein rpm variations with every explosion cylinder are detected and compared with one another, and a fuel injection quantity control actuator is controlled with every cylinder so as to make the rpm variations of respective cylinders uniform, so that engine vibrations due to a dispersion in fuel injection quantity between the cylinders can be reduced, characterized in that said method comprises the steps of:

determining a deviation in the rpm variation from a difference between a mean rpm variation and rpm variations of the respective cylinders;

determining an individual cylinder correction quantity of said fuel injection quantity control actuator in accordance with the deviation in the rpm variation;

detecting engine temperature or fuel temperature;

determining the upper and lower limit guard values of the individual cylinder correction quantity, said values being variable in association with a range, which said fuel injection quantity control actuator can follow up, in accordance with said engine temperature or said fuel temperature;

imposing restrictions on the individual cylinder correction quantity by said upper and lower guard values; and

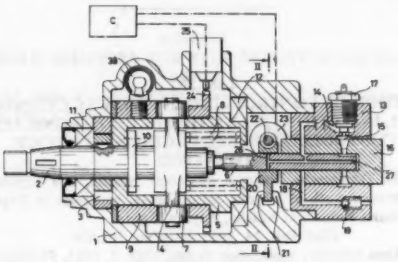
controlling said fuel injection quantity control actuator with every cylinder in accordance with said individual cylinder correction quantity having imposed thereon said restrictions.

4,561,398

INJECTION PUMP REGULATOR SYSTEMS FOR INTERNAL COMBUSTION ENGINES

Manuel Roca Nierga, Leghorn, Italy, assignor to Spica S.p.A., Leghorn, Italy

Filed Jun. 11, 1984, Ser. No. 619,176
Claims priority, application Italy, Jun. 14, 1983, 21616 A/83
Int. Cl.[4] F02M *41/00*
U.S. Cl. 123—449 6 Claims



1. Fuel injection pump comprising a piston (6) movable in a pressure chamber of a casing (1) of the pump, means for imparting reciprocating and rotary motion to said piston in order to effect a combined action of pumping and of distribution to associated cylinders of an internal combustion engine, electronic means (c) for controllably regulating the throughput of the pump and through an actuator (23), controls the displacement of a fuel delivery control element (22), information feedback means (30, 31) responsive to said control element in the form of an annular regulation valve (20) having at least a slot (28) on its inner diameter cooperating with a plurality of discharge bores (26) formed on the outer surface of said piston (6) and connected with said pump pressure chamber, said annular valve 20 being traversed by said piston (6) and being generally axially constrained with respect to said pump casing (1) but capable of angular movement by the said actuator (23) for placing said at least one slot (28) in fluid communication with at least one of said plurality of discharge bores (26) to share the pumping stroke of said piston (6) and thus to determine the length of the active stroke of the piston (6) during fuel delivery, said at least one slot (28) on the inner diameter of the annular valve (20) runs obliquely with respect to the axis of said valve (20) and emerges on at least one planar face of said valve (20) said control element (22) being formed by a helical gear in mesh with a worm gear, said helical gear being defined by said regulation annular valve (20) in the form of a partial toothing of its outer circular surface, said regulation annular valve (20) having a radial ledge (36) cooperating with an adjustment screw (35) for effecting the maximum angular displacement of said regulation annular valve (20) and, consequently, the maximum delivery of the injection pump.

4,561,399

METHOD OF CONTROLLING AIR-FUEL RATIO

Nobuyuki Kobayashi, and Takashi Hattori, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

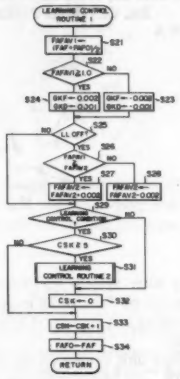
Filed Aug. 24, 1984, Ser. No. 643,711
Claims priority, application Japan, Aug. 30, 1983, 58-158882
Int. Cl.[4] F02M *7/00*
U.S. Cl. 123—478 12 Claims

1. A method of controlling an air-fuel ratio comprising the steps of:

determining a basic fuel injection time duration on the basis of an engine load and an engine speed;

determining a feedback correction coefficient in accordance with a measured air-fuel ratio so that the air-fuel ratio becomes a stoichiometric air-fuel ratio under a predetermined feedback condition;

increasing an altitude compensating learning correction coefficient when a mean value of the feedback correction coefficient reaches a predetermined value or more, and, decreasing the altitude compensating learning correction coefficient when the mean value is less than the predetermined value;



determining a lower limit on the basis of the altitude compensating learning correction coefficient determined during idling of a motor vehicle so as not to bring the altitude compensating learning correction coefficient into a value less than the lower limit; and

determining a final fuel injection time duration in accordance with the basic fuel injection time duration and the altitude compensating learning correction coefficient, whereby fuel is injected for the final fuel injection time duration.

4,561,400

METHOD OF CONTROLLING AIR-FUEL RATIO

Takashi Hattori, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

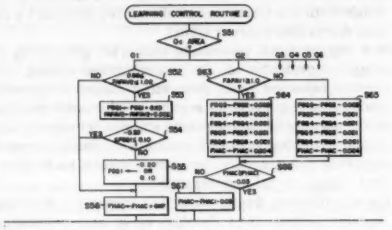
Filed Aug. 24, 1984, Ser. No. 643,712
Claims priority, application Japan, Sep. 1, 1983, 58-160915
Int. Cl.[4] F02M *7/00*
U.S. Cl. 123—478 10 Claims

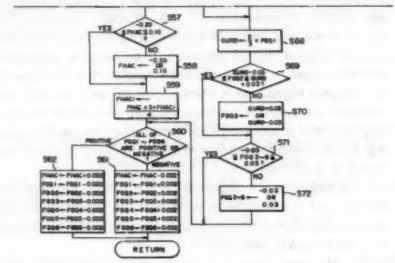
1. A method of controlling air-fuel ratio wherein a basic fuel injection time duration is determined in accordance with an intake air flow rate measured by means for measuring the intake air flow rate and an engine rotational speed, then the basic fuel injection time duration is corrected such that the air-fuel ratio becomes the stoichiometric air-fuel ratio, and an aging of said intake air flow rate measuring means is compensated by learning correction coefficients FGQ_1–FGQ_n for obstruction of said intake air flow rate measuring means, said method comprising the steps of:

judging the intake air flow rate as to which flow rate regions Q_1–Q_n the intake air flow rate belongs to;

renewing, in accordance with the measured air-fuel ratio, the learning correction coefficient FGQ_1 for the flow rate regions Q_1 when judging is made that the intake air flow rate Q belongs to the flow rate regions Q_1 corresponding to an idle condition and the learning correction coefficient

FGQ_2–FGQ_n for respective flow rate regions Q_2–Q_n, respectively, when judging is made that the intake air flow





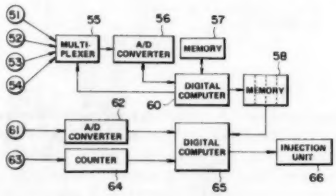
rate Q belongs to one of the flow rate regions Q_2–Q_n, respectively.

4,561,401

AIR-FUEL RATIO CONTROL SYSTEM

Yoshitaka Hata, Fujisawa, and Tatsuo Morita, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Nov. 10, 1983, Ser. No. 550,307
Claims priority, application Japan, Nov. 15, 1982, 57-199053
Int. Cl.⁴ F02D *37/02;* **F02P** *5/04*
U.S. Cl. 123—486 **27 Claims**



1. A method of controlling the air-fuel ratio of a mixture to an internal combustion engine, comprising the steps of:

detecting an engine load condition;

determining, in response to the detected engine load condition, a value of fuel-delivery requirement for the engine;

detecting variations of pressure in at least one cylinder;

detecting an engine crankshaft position θ_{pmax} at which the pressure in the cylinder is at maximum during each pressure detecting cycle, said detecting cycle starting at the top dead center position of an engine piston of the cylinder and terminating at a predetermined number of degrees of rotation of an engine crankshaft from the top dead center position;

comparing the detected engine crankshaft position θ_{pmax} with a lower and upper limit;

detecting the number N1 of times the detected engine crankshaft position θ_{pmax} is greater than the upper limit and the number N2 of times the detected engine crankshaft position θ_{pmax} is smaller than the lower limit during each predetermined number of rotations of the engine crankshaft; and

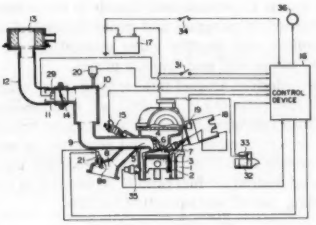
modifying the determined fuel-delivery requirement value based upon the detected numbers N1 and N2.

4,561,402

METHOD AND SYSTEM FOR INTERNAL COMBUSTION ENGINE OXYGEN SENSOR HEATING CONTROL, SYNCHRONIZING HEATER VOLTAGE DETECTION WITH HEATER ENERGIZATION, AND CALCULATING POWER LOSS

Jiro Nakano; Takao Ishibashi; Takao Akatsuka, and Mamoru Takata, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Nov. 9, 1984, Ser. No. 670,066
Claims priority, application Japan, May 7, 1984, 59-090682
Int. Cl.⁴ F02D *5/00;* **G01N** *27/26*
U.S. Cl. 123—489 **4 Claims**



1. For an internal combustion engine comprising an exhaust system and an oxygen sensor fitted to said exhaust system comprising a sensor element and an electrically powered heater for heating said sensor element:

a method for controlling the electrical supply to said heater, wherein:

according to operational parameters of said engine, a target value for the power to be supplied to said heater is determined;

and the mean power in a time interval is controlled as follows: the voltage applied to said heater and the current flowing through said heater are detected, an intermittent voltage is supplied to the heater, and the duty ratio of said intermittent voltage supply is controlled in such a way that the product of the heater voltage and of the heater current is substantially equal to said target power to be supplied;

and wherein the detection of the voltage applied to said heater is synchronized with the energization of said heater.

4,561,403

AIR-FUEL RATIO CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINES

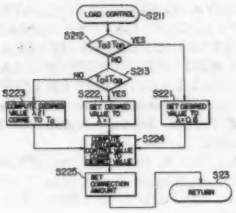
Yoshishige Oyama, Katsuta; Mamoru Fujieda, Ibaraki, and Teruo Yamauchi, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 22, 1984, Ser. No. 643,292
Claims priority, application Japan, Aug. 24, 1983, 58-153203
Int. Cl.⁴ F02D *5/00*
U.S. Cl. 123—489 **14 Claims**

1. An air-fuel ratio control apparatus for internal combustion engines comprising:

a sensor for detecting an intake air flow to an engine;

an engine rotational speed sensor;
an air-fuel ratio sensor for detecting an amount of oxygen over a wide range of operating conditions from a light load operation to a high load operation of said engine;
a cooling water temperature sensor;
throttle valve control means;
fuel supply means;
ignition means, and
a control signal generating circuit for receiving signals from said intake air flow sensor, said rotational speed sensor, said cooling water temperature sensor and said air-fuel



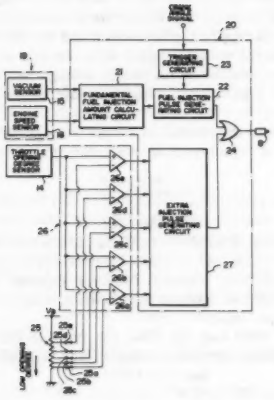
ratio sensor to process said signals in accordance with a predetermined program and generate control signals for controlling said throttle valve control means, said fuel supply means and said ignition means,
whereby a desired air-fuel ratio is set in such a manner that an air-fuel ratio (λ) in a light-load, intermediate-load or high-load operating region of said engine becomes $\lambda > 1$, $\lambda = 1$ or $\lambda < 1$, respectively, and an output of said air-fuel ratio sensor is utilized to make a feedback control such that said desired air-fuel ratio is maintained in each corresponding one of said operating regions.

4,561,404

FUEL INJECTION SYSTEM FOR AN ENGINE

Yoshiaki Kanno, Hyogo, and Tadataka Nakazumi, Hiroshima, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo and Mazda Motor Corporation, Hiroshima, both of, Japan

Filed Sep. 12, 1984, Ser. No. 649,757
Claims priority, application Japan, Sep. 16, 1983, 58-171900
Int. Cl.⁴ F02D *5/02*
U.S. Cl. 123—492 **5 Claims**



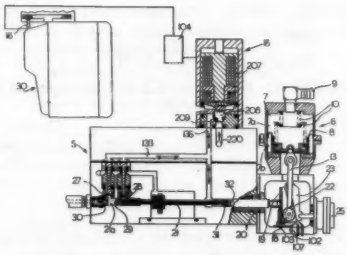
1. A fuel injection system for an internal combustion engine comprising,
a signal detecting means for detecting one of a direct and indirect signal representative of the amount of intake air,
a fundamental fuel injection amount calculating means for calculating a fundamental fuel injection amount in accordance with the amount of intake air represented by one of said direct and indirect signal,
a first trigger signal generating means for generating a first trigger representative of a predetermined timing,
a regular injection pulse generating means for generating and outputting a regular injection pulse corresponding to said fundamental fuel injection amount determined by said fundamental fuel injection amount calculating means to an injection pulse generating circuit means each time said first trigger signal is generated,
a throttle opening degree detecting means for detecting an opening degree of a throttle valve and generating an actual throttle opening degree signal,
a reference value setting means for setting a predetermined plurality of the throttle opening degree reference values,
a comparator means for comparing an actual throttle opening degree represented by said throttle opening degree signal from said throttle opening degree detecting means,
a second trigger signal generating means for generating a second trigger signal each time said actual throttle opening degree signal rises above one of said predetermined plurality of throttle opening degree reference values,
a supplemental injection pulse generating means for generating extra injection pulses each time said second trigger signal is generated,
a fuel injection valve disposed in the intake passage of said engine and responsive to be driven by one of said regular injection pulse and said extra injection pulse to inject fuel into said intake passage,
said throttle opening degree reference values being set such that said reference values are at smaller intervals in the lower region of the throttle opening degree.

4,561,405

CONTROL OF FUEL INJECTION APPARATUS FOR INTERNAL COMBUSTION ENGINES

Peter W. Simons, East Fremantle, Australia, assignor to Orbital Engine Company Proprietary Limited, Balcatta, Australia

Continuation of Ser. No. 454,656, Dec. 30, 1982, abandoned.
This application Dec. 17, 1984, Ser. No. 682,589
Claims priority, application Australia, Dec. 31, 1981, PF2125
Int. Cl.⁴ F02M *17/00, 9/08, 23/00*
U.S. Cl. 123—531 **2 Claims**



1. In a method of delivering a series of discrete, metered quantities of fuel for delivery to an engine comprising filling a metering chamber with fuel, admitting gas to the chamber at a pressure sufficient to displace the fuel from the chamber, displacing the fuel from the chamber by the admitted gas upon selective opening of a discharge port in communication with the chamber, and concontrolling the quantity of fuel displaceable by each admission of the gas to the chamber by adjusting the relative positions of the entry of the gas to and of the discharge of the fuel from the chamber between the positions,

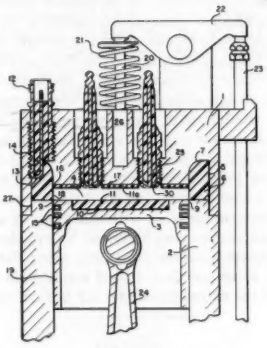
the improvement comprising delivering a base number of deliveries of discrete, metered quantities of fuel per engine cycle by generating a plurality of pulses per engine cycle, said pulses if not suppressed being capable of controlling the displacement of fuel from the chamber, suppressing a proportion of the pulses, and utilizing the pulses not suppressed to cause the said displacement of fuel from the chamber, and recognizing substantial engine load variations with resulting substantial engine fuel demand changes, such as acceleration of the engine, low engine temperature or cranking at starting, to deliver more fuel to the engine than could be rapidly accomplished by said control of the quantity of displaceable fuel by delivering additional metered quantities of fuel to said engine, until the control of the quantity of displaceable fuel becomes effective to meet the new engine load, by increasing the number of deliveries per engine cycle of the metered quantities of fuel above said base number of deliveries by including at least some of the pulses suppressed during delivery of said base number of deliveries to increase the number of pulses causing displacement of fuel from the chamber per engine cycle.

4,561,406

WINGED REENTRANT ELECTROMAGNETIC COMBUSTION CHAMBER

Michael A. V. Ward, Arlington, Mass., assignor to Combustion Electromagnetics, Inc., Arlington, Mass.

Filed May 25, 1984, Ser. No. 614,338
Int. Cl.[4] F02P *1/00*
U.S. Cl. 123—536 **35 Claims**



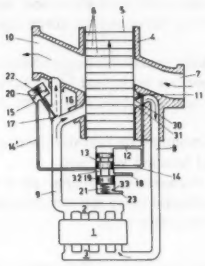
1. In a combustion system including at least one combustion chamber with one essentially continuous electrically conducting surface defining at least one major portion of said chamber, means for producing a combustible mixture therein, means for igniting said mixture, means for generating and for conducting to said chamber electromagnetic (EM) energy of frequency f to be resonantly stored in said chamber during combustion of said mixture, the improvement therein comprising a dielectric filled wing electrical volume of annular form placed at a perimeter of said chamber which is sufficient in volume and dielectric properties to lower resonant frequency fo of the chamber excluding the wing by at least one third the value fo, i.e., f=⅔* fo and construction of said volume and means for conducting E energy to provide a maximum of the current produced by conducting EM energy to the chamber in the annular wing and wherein said EM energy conducted during the period of combustion of the mixture is amplitude modulated during said period at a low frequency in the range of 1 KHz to 10 MHz with a duty cycle of a few percent to 100%.

4,561,407

CONTROL EQUIPMENT FOR A PRESSURE WAVE SUPERCHARGER

Francois A. Jaussi, Wettingen; Andreas Mayer, Niederrohrdorf, and Fritz W. Spinnler, Liestal, all of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed May 1, 1984, Ser. No. 605,909
Claims priority, application Switzerland, May 2, 1983, 2355/83
Int. Cl.[4] F02B *33/42*
U.S. Cl. 123—559 **6 Claims**



1. In a gas dynamic pressure wave supercharger having a region of high pressure discharge, an exhaust by-pass passage and a by-pass valve opening and closing said by-pass passage, an apparatus for actuating said exhaust by-pass valve comprising:

a control device means for opening and closing said by-pass valve in response to a regulating pressure;

pressure relief means; and

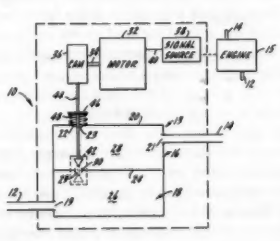
a precontrol device including a body movable between a first position communicating said control device means with said region of high pressure discharge and a second position communicating said control device means with said pressure relief means, means for biasing said body toward said second position and means for introducing pressure in opposition to said biasing means from said region of high pressure discharge such that said body remains at said second position until pressure from said region exceeds said regulating pressure and causes said body to locate at said first position.

4,561,408

MOTORIZED FLOW CONTROL VALVE

Patrick A. Jenkins, Decatur, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jan. 23, 1984, Ser. No. 573,175
Int. Cl.[4] F02M *25/06*
U.S. Cl. 123—571 **8 Claims**



1. A valve control system for an exhaust gas recirculation system comprising:

a valve assembly having a housing with a wall which defines

a cavity, an inlet port, a discharge port, a top surface and a stem bore with a seal means positioned in said stem bore;

drive means, including a stepper motor having a drive shaft extending therefrom and operable by said stepper motor;

a cam operator connected for operation by said drive shaft;

a separator mounted in said cavity and cooperating with said wall to define a discharge chamber and an inlet chamber, said discharge port communicating with said discharge chamber,

said inlet port communicating with said inlet chamber,

said separator also defining a valve seat and a separator bore communicating between said discharge and inlet chambers;

a valve positioned in said discharge chamber and operable to seal said separator bore, said valve having a stem extending through said stem bore seal means to contact said cam operator;

a keeper plate mounted on said stem between said cam operator and said housing wall; and

a bias spring between said keeper plate and housing top surface to urge said valve into contact with said valve seat to seal said separator bore.

4,561,409

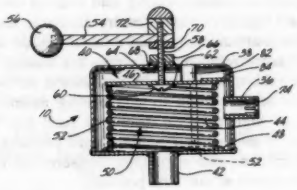
SELF-CLEANING SMOG CONTROL FILTER FOR INTERNAL COMBUSTION ENGINES

John J. Fernandez, 1620 S. Myrtle Ave., Monrovia, Calif. 91016

Filed Oct. 26, 1984, Ser. No. 665,173

Int. Cl.⁴ F02M *25/06*

U.S. Cl. 123—572 **11 Claims**



1. A self-cleaning smog control filter for recycling gaseous fluids through the combustion system of an internal combustion engine, the smog control filter comprising a filter housing having a hollow interior, coil spring filter means secured within the hollow interior, closure means on the coil spring filter means for closing a filtration chamber within the interior of the coil spring filter means, the coil spring filter coils having a separation space between them for filtering gaseous fluids passing through said separation space from the interior of the coil spring filter, a shaft secured to the coil spring filter means and extending to the exterior of the housing so that axial tension on the shaft provides a preset amount of spacing between adjacent coils springs of the filter, an inertial arm secured to the shaft for rotating the shaft for twisting the coil spring filter about its axis in opposite directions, tension setting means engaged with the shaft and holding a preset tension on the shaft to maintain a preset micro filtration space between the filter coils, stop means inside the housing interior and cooperating with the filter coil for limiting the angle of rotation through which the filter coil can rotate under inertial sensed by the inertial arm, an entry port to the filtration chamber inside the coil spring filter for receiving gaseous fluids from the engine crankcase, and an exit port through the housing for passing filtered gaseous fluids to the intake manifold of the engine.

4,561,410

MAGNETO IGNITION UNIT WITH CONTROL CIRCUIT POTTED TOGETHER WITH THE ARMATURE WINDINGS, FOR INTERNAL COMBUSTION ENGINES

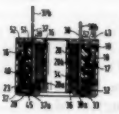
Emil Buchschmid, Rosstal; Lothar Gademann, Rottenburg; Adam Hirt, Ammerndorf; Manfred Hüttinger, Oberasbach; Hans P. Jahn, Dliezhausen; Josef Orova, Schwabach; Hans-Dieter Schmid, Nuremberg, and Horst-Günter Steffen, Schwarzenbruck, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 17, 1985, Ser. No. 724,079

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1984, 3414691

Int. Cl.⁴ F02P *1/08, 3/08*

U.S. Cl. 123—599 **10 Claims**



1. Magneto ignition unit for an internal combustion engine comprising a magneto generator arranged to be driven by said engine, said magneto generator having a rotary pole wheel and a stationary ignition armature having an iron core, around

a leg of which a primary and a secondary winding are wound, a high voltage terminal for connecting said secondary winding to at least one spark plug of said engine, and a re-entrant cup-like vessel surrounding said leg of said core and said windings, said leg of said core having an extremity protruding through said vessel and said vessel having a cooling body and a hybrid electronic circuit unit potted therein together with said primary and secondary windings, said cooling body and hybrid electronic circuit unit, according to the invention, being flat and oriented parallel to an end face of said windings in the neighborhood of the extremity of said leg of said core.

4,561,411

IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINE

Katsuyoshi Masuno, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 426,595, Sep. 29, 1982, Pat. No. 4,494,519. This application Aug. 29, 1984, Ser. No. 645,188

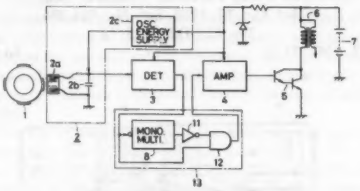
Claims priority, application Japan, Oct. 1, 1981, 56-146939[U]

Int. Cl.⁴ F01P *1/00*

U.S. Cl. 123—615 **2 Claims**

1. A breakerless ignition system for an internal combustion engine comprising: a magnetically permeable rotor (**1**) driven in synchronism with an internal combustion engine, a core disposed in confronting relation to said rotor and having a coil (*2a*) wound therearound, a capacitor (*2b*) connected to said coil to form a resonant circuit therewith, a supply circuit (*2c*) for supplying said resonant circuit with oscillation energy, a threshold detector circuit (**3**) for detecting the condition of oscillation of said resonant circuit, an amplifier (**4**) for amplifying an output signal from said detector circuit, a switching element (**5**) driven by an output signal from said amplifier, an

ignition coil (6) for generating a high voltage in response to intermittent operation of said switching element, and means for holding said switching element in a deenergized state for a predetermined period of time after it has been turned off to prevent false triggering by the detector circuit due to spurious



signals induced in the coil by spark ignition firings, said holding means comprising: (a) a monostable multivibrator (8) triggered by the detector circuit output simultaneously with the deenergization of said switching element, and (b) means for driving said switching element jointly by an output signal from said multivibrator and said detector circuit output.

4,561,412

IGNITION APPARATUS FOR INTERNAL COMBUSTION ENGINES

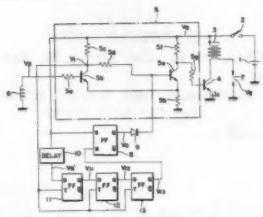
Toshikazu Saita, Kakogawa; Toshiyuki Hino, Hyogo, and Masami Matsumura, Himeji, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 13, 1984, Ser. No. 650,111

Claims priority, application Japan, Sep. 17, 1983, 58-171590; Nov. 15, 1983, 58-216767; Dec. 27, 1983, 58-246890

Int. Cl.⁴ F02P *5/04*

U.S. Cl. 123—617 **15 Claims**



1. An ignition apparatus for internal combustion engines comprising:

means for generating an ignition signal synchronizing with an engine speed;

a circuit, formed of first and second amplifying stages, for processing the wave form of the output signal of said ignition signal generating means;

a switching circuit driven by the output signal of said second stage of said wave form processing circuit to induce a discharging voltage across an ignition coil;

a DC power source for supplying power to said wave form processing circuit and said switching circuit; and,

a bistable means set by said DC power source voltage and reset by the output of said first stage of said wave form processing circuit, said bistable means holding said reset state and controlling said second stage so as not to induce the discharging voltage across said ignition coil, at least during the time interval of said set and reset operations.

4,561,413

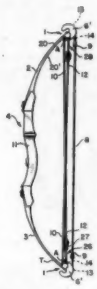
COMPOUND BOW WITH IMPROVED LIMB TIP HANGER

Thomas P. Jennings, Sun Valley, Calif., assignor to Kidde Recreation Products, Inc., Chicago, Ill.

Filed Feb. 7, 1984, Ser. No. 577,896

Int. Cl.⁴ F41B *5/00*

U.S. Cl. 124—23 R **12 Claims**



1. In an archery bow provided with a pair of limbs each having a pair of split limb portions defining a crotch therebetween, each said split limb portion including opposite side surfaces, a back surface, a belly surface and an end surface, a rotatable member supported adjacent each said pair of split limb portions, a pair of power cables each having one end terminating adjacent one said pair of split limb portions, a bowstring spanning said rotatable members; the improvement comprising, a limb tip hanger assembly mounted on each said pair of split limb portions, each said hanger assembly including a pair of separate detachable hanger members void of any permanent rigid connection between one another, each said hanger member having a plurality of walls respectively overlying a plurality of said surfaces of each said split limb portion, said walls of each said hanger member including a pair of side walls respectively overlying said opposite side surfaces of each said split limb portion, a removable axle mounted through said side walls and spanning each pair of said hanger members, one said rotatable member carried by each said axle between each two of said hanger members of each said pair of hanger members, means respectively attaching said one end of each said power cable to each one of said axles whereby, with said bow in a strung condition the tension applied by said bowstring and power cables maintains the two separate hanger members of each said hanger assembly attached in a fixed relationship upon the respective split limb portions solely by the application of pressure upon at least one said hanger member wall against one said split limb portion surface.

4,561,414

BALL THROWING MACHINE

Fujio Nozato, 33-20, Izuo 1-chome, Taisho-ku Osaka-shi, Osaka-fu, Japan

Filed Jun. 29, 1984, Ser. No. 626,176

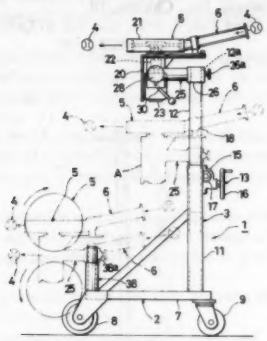
Claims priority, application Japan, Mar. 12, 1984, 59-35854[U]; Mar. 12, 1984, 59-35855[U]

Int. Cl.⁴ F41B *3/04*

U.S. Cl. 124—78 **5 Claims**

1. A ball throwing machine including a ball throwing machine body having a pair of rotatable bodies adapted to be rotated in opposite directions and at different speeds with a ball nipped therebetween to be thereby thrown, a pillar member extending upwardly from a base, and support means for supporting the ball throwing machine body on the top of the pillar member, said ball throwing machine being characterized in that said support means is of the ball joint type comprising a ball body and a support member holding said ball body and

adapted to be turnable around the center of said ball body, said ball body projecting in a substantially horizontal direction forwardly or rearwardly from one of the elements, the ball



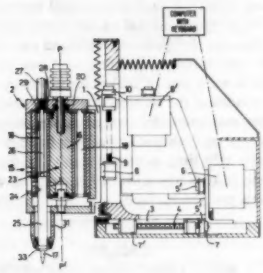
throwing machine body and the pillar member, said holder member projecting on the other element, said ball body and said holder member being adapted to be fixed in a relative, arbitrary turned posture.

4,561,415

APPARATUS FOR PROFILING AN ABRASIVE MILLSTONE

Henri Willot, Glabais, Belgium, assignor to Societe de Recherches et de Developpement Industriel S.A., Glabais, Belgium

Filed Dec. 7, 1983, Ser. No. 559,113
Claims priority, application Belgium, Dec. 14, 1982, 0/209730
Int. Cl.[4] B24B *53/12*
U.S. Cl. 125—11 R **4 Claims**



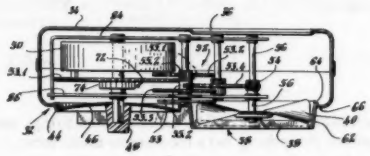
1. An apparatus for profiling, truing and dressing a millstone comprising a fixed head mounted in operational relationship with a grinder, said head having a housing and a cylinder rotatable about an axis within said housing, said cylinder being provided with a plurality of seats each of which contains a feed member on which is secured a cutting tool, means for rotating incrementally said cylinder such that a desired cutting tool is positioned proximate to a profiling, truing and dressing station, means for locking said cylinder in position at said station, means for moving said feed members within said seats such that a desired cutting tool is displaced from a retracted position to an extended position in contact with said millstone, and means for clamping said cutting tool in order to secure it into position with respect to said millstone.

4,561,416

SELF-CONTAINED PORTABLE OVEN AIR CIRCULATOR

John T. Loechner, Westport; Kurt J. Kruger, Huntington, both of Conn.; John R. Nottingham, Richmond Heights, and Joe M. Golembek, Cleveland Heights, both of Ohio, assignors to The Associates Group Partners, Westport, Conn.

Filed Apr. 13, 1983, Ser. No. 484,494
Int. Cl.[4] D24C *15/32*
U.S. Cl. 126—21 A **10 Claims**



8. An air circulator for an oven having a food heating chamber comprising:

a compact self-contained portable housing sized to fit within the oven chamber with food being heated therein, said housing enclosing a manually windable spring motor located on one side of the housing, a manual wind-up lever connected to the spring motor and mounted on said one housing side;

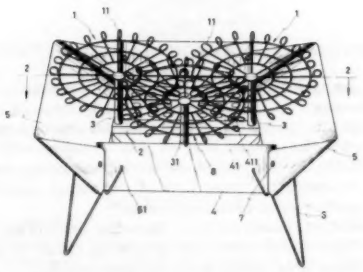
a propeller located in the housing at the other side of the housing, a reduction gear train inside the housing and interconnecting the spring motor to the propeller, said housing having an air inlet and air outlet at said other side of the housing with the propeller located between the inlet and the outlet to cause a circulation of air from the outlet when the spring motor is wound up without the exposure of the spring motor to the flow of air between the air inlet and air outlet parts, said housing, motor, lever, propeller and reduction train being made of metal to enable operation inside a heated oven.

4,561,417

BARBECUE OVEN

Ming-Tang Chen, No. 14, Alley 89, La. 59, Nan Men Rd., Taichung, Taiwan

Filed Sep. 5, 1984, Ser. No. 647,448
Int. Cl.[4] A47J *37/00*
U.S. Cl. 126—25 A **3 Claims**



1. A barbecue grill comprising:

a grill body having four sides and a planar bottom for holding charcoal;

a plurality of ash dispensing holes in said bottom;

a support seat on said bottom;

a plurality of seating holes in said support seat;

upwardly extending support rods removably insertable into said seating holes at their lower ends;

a plurality of dish-shaped cooking racks, each comprising a plurality of spaced strips extending substantially radially outwardly from a central portion of the rack with the outer ends of said strips bent upwardly, and a connection on the lower side at said central portion for removably connecting said rack to the upper end of one of said support rods;

pivotal side plates pivotally attached to two opposite sides of said grill body and having a configuration so that when in position for use said side plates are inclined upwardly and outwardly with respect to said bottom, and said side plates can be pivoted to substantially cover the top of said grill body;

support leg receiving holes in the sides of said grill body other than said pivotal side plates; and

support legs for supporting said grill body above a surface each comprising, a flexible rod-like element having a central portion for engaging a surface, upwardly extending portions extending from the ends of said central portion, inwardly turned portions on the upper ends of said upwardly extending portions insertable into said support leg receiving holes, and intermediate bent portions between said upper ends and said central portion engageable under at least part of said bottom, said legs being pivotable in said support leg receiving holes so that when said side plates are in the covering position, said legs can be pivoted to extend upwardly over said side plates to form a handle for carrying said grill.

4,561,418

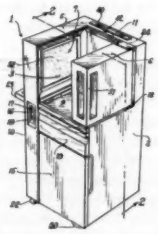
BARBECUE GRILL

Gordon Cairns, 23639 Country Villa Rd., Ramona, Calif. 92065

Filed Jul. 11, 1984, Ser. No. 629,956

Int. Cl.⁴ A47J *37/00*

U.S. Cl. 126—41 R **11 Claims**



1. A barbecue grill comprising:

vertical, spaced radiant heating panels defining a cooking area therebetween;

at least one gas burner mounted within each heating panel;

a back panel defining a back face of said cooking area;

horizontal slide rail means across said back panel;

bearing means on each of said heating panels for sliding engagement within said rail means, so that said heating panels are slidable towards and away from each other;

means for pivotally mounting said panels to said bearing means about a vertical axis;

a supply of pressurized combustible gas;

lines for transporting gas from said supply to said gas burners

means for allowing movement of said lines as said heating panels are slid and pivoted throughout their range of movement;

a drip pan for collecting food wastes mounted below the cooking area; and

means for converting said grill to a radiant space heater by pivoting each of said heating panels about a vertical pivot axis so that each faces outwards and away from said cooking area.

4,561,419

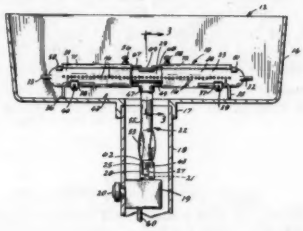
ADJUSTABLE BURNER ASSEMBLY

Walter Koziol, Antioch, Ill., assignor to Modern Home Products Corp., Antioch, Ill.

Filed Apr. 18, 1984, Ser. No. 601,546

Int. Cl.⁴ F24C *3/00*

U.S. Cl. 126—41 R **15 Claims**



1. A burner element for a gas barbecue grill comprising:

a first hollow body member;

a gas intake member in fluid communication with said hollow body member;

a second hollow body member positioned in telescoping relationship with respect to said first hollow body member;

a third hollow body member positioned in telescoping relationship with respect to said first hollow body member and opposite said second body member, said first, second and third hollow body members including means to effect said telescoping relationship; and

a plurality of apertures distributed over each said body member.

4,561,420

WOODBURNING STOVE, FIREPLACE OR THE LIKE

Torben H. Thomsen, Brabrand, Denmark, assignor to Dalso Maskinfabrik AF 1976 A/S, Brabrand, Denmark

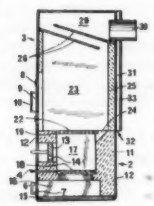
PCT No. PCT/DK81/00026, § 371 Date Nov. 4, 1981, § 102(e) Date Nov. 4, 1981, PCT Pub. No. WO81/02621, PCT Pub. Date Sep. 17, 1981

PCT Filed Mar. 9, 1981, Ser. No. 320,960

Claims priority, application Denmark, Mar. 7, 1980, 979/80; Dec. 3, 1980, 5145/80

Int. Cl.⁴ F24C *1/14*

U.S. Cl. 126—77 **12 Claims**



1. A woodburning stove, fireplace or the like comprising a hearth or a first chamber with a flue outlet at a top thereof, said hearth being provided with a front opening or a front door, characterized in that at least a part of the bottom of the hearth or first chamber includes a closeable heat resistant bottom plate, said heat resistant bottom plate being closed and substantially air impermeable during normal firing conditions, a further chamber for alternative combustion of solid, liquid or gaseous fuel and also flue gas rich fuel is provided immediately

below the bottom plate forming the upper boundary of the combustion zone of said further chamber, said further chamber having a total height being substantially equal to lesser of the width and depth of said further chamber and an air inlet damper means and a shaking grate above an ash pit in the bottom of said further chamber for supplying air to said further chamber, the further chamber is lined with a refractory material such as bricks, and in that a permanently open flue outlet means is provided at the rear end of the bottom plate for constantly communicating the further chamber with the first chamber, the bottom plate being of a high heat resistant material and is placed at a level above the flames from the fuel so that the bottom side of said bottom plate glows during normal firing conditions so as to obtain a total combustion of flue gas from fuel supplied to the further chamber within said further chamber.

4,561,421

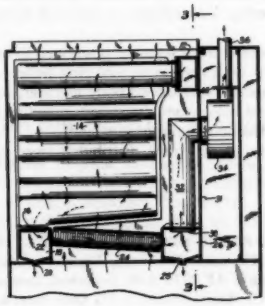
HIGH EFFICIENCY FURNACE

Kyu S. Hwang, St. Claire Beach, and Dennis J. Koestler, Leamington, both of Canada, assignors to Duo-Matic/Olsen Inc., Ontario, Canada

Division of Ser. No. 562,437, Dec. 16, 1983, Pat. No. 4,537,178. This application Feb. 1, 1985, Ser. No. 697,282

Int. Cl.[4] F24H *3/02*; F24D *5/00*

U.S. Cl. 126—110 R **1 Claim**



1. In a furnace having

an exterior housing including means for introducing air to be heated and means for discharging heated air from the furnace;

at least on primary heat exchanger having a combustion chamber for the ignition of fluid fuel yielding hot combustion gases;

a condensing heat exchanger in fluid communication with said primary heat exchanger for receiving combustion gases and condensate, and having drainage means for pooling and removing condensate;

exhaust means communicating with the condensing heat exchanger for removing combustion gases from the housing; and

an induced draft blower for (a) drawing combustion gases through the heat exchangers, (b) inducting sufficient air to the combustion chamber of the primary heat exchanger for efficient combustion, and (c) forcing the combustion gases through the exhaust means;

the improvement comprising:

a dual sensing device for detecting either a change in combustion gas flow rate and/or a predetermined condensate level within the drainage means of the condensing heat exchanger, said dual sensing device comprising a hollow tube configured within the furnace housing to extend from an electrical pressure switch, capable of transducing a change in fluid pressure into an electrical signal, to the region within the condensing heat exchanger where the condensate is pooled and drained from the heat exchanger, said tube having an open sensing end oriented at the predetermined point where the condensate level is to be detected within the condensing heat exchanger so that condensate reaching the predetermined point will seal said open sensing end, a transmitting end for transmitting any fluid pressure change detected by the sensing end to the electrical pressure switch, and a vent communicating the interior of the tube with the exterior of the tube.

4,561,422

HOT AIR TYPE HEATER

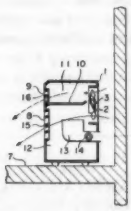
Masanori Hara, Yokohama, and Sakuo Sugawara, Kamakura, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 27, 1984, Ser. No. 675,181

Claims priority, application Japan, Dec. 13, 1983, 58-234878; Jan. 26, 1984, 59-12264

Int. Cl.[4] F24H *3/02*

U.S. Cl. 126—110 R **18 Claims**



1. A hot air type heater, which comprises in combination:

(a) an inlet port formed in one surface part of a casing for the heating apparatus;

(b) an air blower for sucking air in the room into the casing through the inlet port, and forming a current of air within the casing;

(c) a second heating section having means for heating most of the air as taken in from the inlet port;

(d) a second outlet port formed in the lower front surface part of the casing and to blow forward high temperature air heated at the second heating section;

(e) a first heating section having means for heating a remainder of the air taken into the casing through the inlet port to a temperature level higher than the temperature of the room air but lower than the temperature of the air heated by the second heating section, said means for heating said remainder of the air comprising a thermally conductive partition plate separating said first and second heating sections; and

(f) a first outlet port formed in the upper part of the second outlet port and to blow forward slightly warm air heated at the first heating section.

4,561,423

SOLAR PARABOLIC COLLECTOR

Dennis R. Blasey, 2365 Pauline Ave., Sparks, Nev. 89431

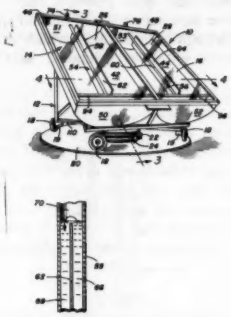
Filed Jun. 11, 1984, Ser. No. 619,188

Int. Cl.[4] F24J *3/02*

U.S. Cl. 126—425 **13 Claims**

1. Apparatus for the solar heating of water or the like comprising an elongate parabolic solar reflector having a focal line on which solar rays impinging on the reflector are focused, and a liquid circulation tube positioned substantially along the focal line, wherein the tube is split longitudinally by an internal vane into forward and reverse flow liquid passages, with a liquid inlet for the forward passage and a liquid outlet for the reverse passage toward one end of the tube, the vane terminating short of the other end of the tube to provide a space for reversal of liquid flow through the tube, wherein the tube has elongate

heat transfer-enhancing fin means extending outwardly therefrom, wherein the reflector is supported on a frame with the tube extending upwardly and on an incline to the horizontal, wherein the frame is mounted on wheels for rotation of the



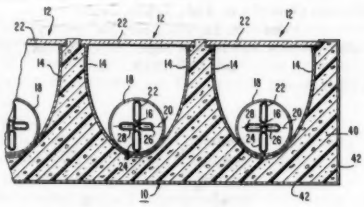
reflector to attract the sun, and wherein the apparatus includes a programmable timer-controlled reversible electric motor for providing stepped rotation of the frame through the course of a day to track the sun, reverse and return of the frame to a starting position for the following day.

4,561,424

NONTRACKING PARABOLIC SOLAR ENERGY COLLECTOR APPARATUS

Michael T. Gill, Sugarland, and Mark C. Rogers, Baytown, both of Tex., assignors to Advanced Solar Systems, Midland, Tex.

Filed Jul. 19, 1985, Ser. No. 756,541
Int. Cl.[4] F24J *3/02*
U.S. Cl. 126—438 **6 Claims**



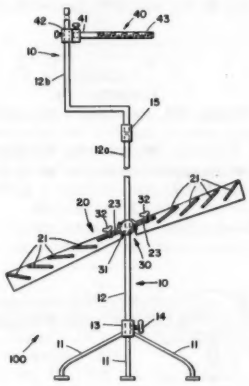
1. A solar energy heat collector which comprises:
an elongated cylindrical heat entrapment tube,
a plurality of heat collector tubes secured within said cylindrical heat entrapment tube,
said plurality of heat collector tubes including a first pair of oppositely disposed elongated substantially rectangular tubes secured relative to each other with their major axis extending in a horizontal direction,
a second pair of oppositely disposed elongated substantially rectangular tubes secured relative to each other with their major axis extending in a vertical direction,
each of said first and second pair of elongated substantially rectangular tubes being positioned with their center line on a plane passing through the center line of said cylindrical heat entrapment tube,
one end of one of said heat collector tubes have an inlet connected thereto and one end of one of said second pair of heat collector tubes have an outlet connected thereto with said inlet and said outlet on the same end of said heat entrapment tube, and 180° turn connectors for interconnecting adjacent ends of one collector tube of each of said first and second pairs of collector tubes to each other excluding said ends connected to said inlet and said outlet
a support,
at least one trough in the support, said at least one trough having an internal reflective surface comprising two oppositely disposed truncated parabolic sections rotated away from its vertical axis to create a wide angle of acceptance opening, and a reflective circular face joining the ends of said two parabolic sections which are opposite said acceptance opening, said reflective surface being molded with said support, said internal reflective surface having a focal line to which said internal reflective surface reflects incident solar energy,
said heat entrapment tube being located in said at least one trough at said focal line.

4,561,425

SOLAR COOKER

John B. Long, P.O. Box 404, Agoura, Calif. 91301, and Robert R. Ware, 2600 The Alameda, Santa Clara, Calif. 95050

Filed Jan. 30, 1984, Ser. No. 574,732
Int. Cl.[4] F24J *3/02*
U.S. Cl. 126—451 **3 Claims**



1. A solar cooking device comprising:
a converging reflector constructed from a plurality of reflective, concentric rings lying in a planar configuration with each ring tilted to reflect radiation falling normal to the plane of said rings to converge at a focal area,
a support for said reflector,
universal means attaching said reflector to said support, and
means including a double crank to hold a carrier for a cooking vessel, said means connected to said support above said reflector a distance approximately the focal length of said reflector.

4,561,426

MAGNETIC BIOLOGICAL DEVICE

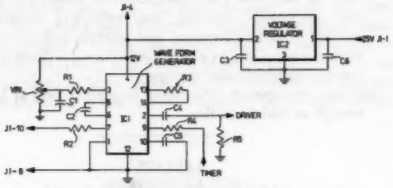
David J. Stewart, R.R. #2, Loretto, Ontario, Canada (L0G 1L0)

Filed Sep. 27, 1984, Ser. No. 654,945
Claims priority, application Canada, Feb. 29, 1984, 448526
Int. Cl.[4] A61B *17/52*
U.S. Cl. 128—1.5 **18 Claims**

1. An electromagnetic device for modifying any of the growth, repair or maintenance processes in a predetermined local area of a living body comprising:
a coil capable of inducing a magnetic field wherein the magnetic field has a time-varying spatial-configuration and a time-constant spatial-orientation with respect to said coil;

means for generating an electrical signal capable of exciting said coil so as to induce a magnetic field having a time-varying spatial-configuration, wherein said signal has a substantially-symmetric waveform with a frequency below about 100 Hertz; and

wherein, when said device is in use, said coil is adapted such that the spatial-orientation of said magnetic field with



respect to said local area is capable of being varied in time, thereby causing time variations in said magnetic field at any given location in said local area which are of about the same range of magnitude as time variations in the magnetic field at said any given location caused by the time variations in the spatial-configuration of said magnetic field.

4,561,427

ENDOSCOPE

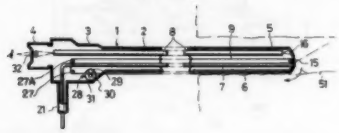
Masazumi Takada, 403, Jinguumae 6-25-8, Shibuya-ku, Tokyo, Japan

Filed Dec. 29, 1983, Ser. No. 566,885

Claims priority, application Japan, Jan. 5, 1983, 58-673; Aug. 8, 1983, 58-123349[U]

Int. Cl.⁴ A61B *1/06*

U.S. Cl. 128—4 **12 Claims**



1. An endoscope comprising an insertion tube having a proximal end and a forward end, at least one endless belt extending substantially from the proximal end to the forward end through said insertion tube, said endless belt being partially exposed in the longitudinal direction on the outer surface of said insertion tube and being guided around the proximal end of said insertion tube, and drive means for turning said at least one endless belt provided at the proximal end of said insertion tube.

4,561,428

SUCTION CONTROLLER OF ENDOSCOPES

Yutaka Konomura, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Japan

Filed Jul. 12, 1984, Ser. No. 630,071

Claims priority, application Japan, Jul. 18, 1983, 58-110227

Int. Cl.⁴ A61B *1/00*

U.S. Cl. 128—4 **10 Claims**

1. A suction controller of an endoscope, comprising:

a support tube communicating with a channel of said endoscope and having a valve seat on the inner periphery thereof;

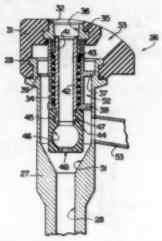
a suction tube connection to said support tube at a position located above said valve seat and normally communicating with said support tube;

a guiding tube provided within said support tube;

a shiftable tube which is slidably guided by said guide tube within said support tube and is movable between an upper and a lower position;

actuation means for resiliently urging said shiftable tube upwardly into said upper position, and

a resilient valve member mounted on said shiftable tube and having a through-hole through which said shiftable tube communicates with said channel, said valve member



closely bearing against said valve seat to break the communications between said channel and said suction tube when said shiftable tube is moved into said lower position in response to the application of an external downward force applied to said shiftable tube, said shiftable tube together with said resilient valve member returning to said upper position under the focus of said actuation means alone when said externally applied downward force is removed from said shiftable tube.

4,561,429

FLASHLIGHT CONTROL APPARATUS FOR ENDOSCOPE

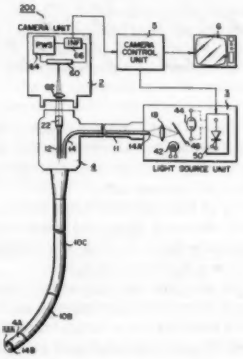
Ken Sato; Yutaka Takahashi; Takashi Tsukaya; Shinichi Kato, and Shinichiro Hattori, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 11, 1983, Ser. No. 540,837

Claims priority, application Japan, Oct. 15, 1982, 57-180846

Int. Cl.⁴ A61B *1/06*

U.S. Cl. 128—6 **4 Claims**



1. A light flash control apparatus for an endoscope having an image guide member and a light guide member, comprising:

light source means, coupled to one end of the light guide member, including at least a lamp for illuminating an object during monitoring, a flash tube for illuminating the object during photographing, and a light path selecting member for selectively transferring light from one of said lamp and said flash tube through one end of the light guide

member to an object under examination when located near the other end of the light guide member;

camera means, adapted to be detachably mounted to said endoscope, including a solid-state image sensor optically coupled to the image guide member, for producing at least image signals of the object as photometric signals when the object is illuminated by said lamp;

camera control means connected to receive the photometric signals from the solid-state sensor of the camera means; and

light flash control means, coupled to said camera control means and to said flash tube, including a turn-on/turn-off control circuit and an exposure/light processing circuit, said exposure/light processing circuit processing the photometric signals so as to precalculate an exposure value desirable for photographing, and said turn-on/turn-off control circuit controlling both the turning on and off of said flash lamp based upon said precalculated exposure value during a photographing operation.

4,561,430

LIGHT SOURCE FOR DIAGNOSTIC TEST

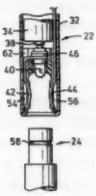
David J. Walsh, 2512 Mississauga Rd., Mississauga, Ontario, Canada (L5H 2L5)

Filed Aug. 3, 1984, Ser. No. 637,632

Claims priority, application Canada, Jun. 11, 1984, 456314

Int. Cl.[4] A61B *1/06*

U.S. Cl. 128—6 **7 Claims**



1. A light source for use with diagnostic devices such as laparoscopes having a male fitting to receive a light tube connection for transmitting light within the device to an end for viewing using an eyepiece on the device, the light source comprising:

an elongate casing;

an electrical storage battery contained in the casing and extending longitudinally of the casing with first and second poles at opposite ends of the battery;

a tubular insulating insert positioned inside the casing at one of the ends thereof and adjacent the first of the poles;

a bulb located in the insert and having the centre terminal of the bulb in electrical connection with the first pole;

first and second contacts insulated from one another and located by the insert, the first contact being coupled to the body of the bulb, and the second contact being coupled electrically to the second pole, both of the contacts projecting slightly within the insert whereby when the light source is pushed over the male fitting, the light source is located on the diagnostic device and the male fitting completes the circuit to power the bulb, so that light passes through the device to said end of the device.

4,561,431

LAVAGE SYSTEM WITH LINEAR MOTOR

Robert W. Atkinson, Dover, Ohio, assignor to Snyder Laboratories, Inc., Dover, Ohio

Filed Dec. 1, 1982, Ser. No. 445,797

Int. Cl.[4] A61H *7/00*

U.S. Cl. 128—66 **12 Claims**

1. Medical, dental or therapeutic lavage apparatus comprising:

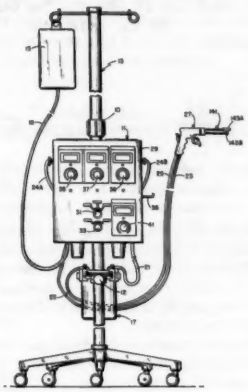
a chamber having an inlet port and an outlet port;

a reciprocating means for imparting a pulsatile flow to liquid moving from the inlet port to the outlet port;

a linear electric motor having a drive member;

means for supporting said motor and said chamber in stable relationship;

means for connecting the motor drive member to said reciprocating means to produce said pulsatile flow;



means for producing an electrical power signal and for applying said signal to said motor;

means for varying the frequency of said power signal, said means including a manually settable frequency control; and

means for varying the amplitude of said power signal, said means including a manually settable amplitude control.

4,561,432

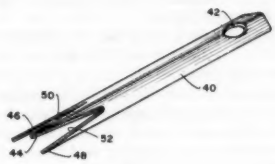
FRACTURED FEMUR FIXATION SYSTEM

Boris B. Mazor, Beverly Hills, Calif., assignor to Floyd A. Coard, M.D., Los Angles, Calif.

Filed Sep. 15, 1983, Ser. No. 532,361

Int. Cl.[4] A61F *5/04*

U.S. Cl. 128—92 BA **10 Claims**



1. A fractured femur fixation system for assisting in healing of the femur, said system comprising:

a nail adapted to be forced into the proximal extremity of the femur, said nail being formed of rigid sheet material, said nail being elongated terminating in a fore end and an aft end, said nail in transverse cross-section having an angular configuration, said fore end being formed into a plurality of prongs with there being a pair of side prongs and a center prong located there between, said center prong having a sharpened straight tip, each said side prong having a sharpened outwardly flared tip, the length of said side prongs being substantially equal to the length of said center prong, whereby as said nail is forced into the femur the said tips of said side prongs slightly spread apart which

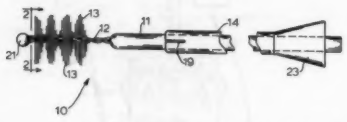
creates a holding force tending to retain said nail in its established position, whereby said system also includes means for nail placement and means for nail extraction.

4,561,433

INTRAUTERINE DEVICE REMOVER

Robert G. Wheeler, Greenbank, Wash., and David M. Potts, Durham, N.C., assignors to Family Health International, Research Triangle Park, N.C.

Filed Aug. 27, 1984, Ser. No. 645,035
Int. Cl.[4] A61F *5/46*
U.S. Cl. 128—130 **2 Claims**



1. Apparatus for removing an intrauterine device from a uterus via the cervical canal opening with said device being of the tailless type or of the tail type with the tail retracted in the uterus and in either case having a portion thereof suitably formed for being engaged by a hook to facilitate such removal, said apparatus comprising:

(a) an elongated handle and a distal part integral therewith, said handle being sufficiently flexible to flex when inserted in the cervical canal opening;

(b) a hollow, elongated tube mounted and slidable axially on said handle from a first advanced position where said distal part is contained within said tube to a second retracted positon where said distal part extends outwardly from said tube; and

(c) a plurality of resilient monofilament fiber elements of uniform diameter secured to and extending radially outward from said distal part, each of said elements having a hook formed at the outer end thereof and extending in a generally circumferential direction around the axis of said distal part, said fiber elements including said hooks being compressed within said tube in said tube advanced position and being fully extended and exposed for use in said tube retracted position.

4,561,434

LAUNDERABLE CLOTH-LIKE PRODUCT FOR SURGICAL USE AND METHOD OF MAKING THE SAME

Jeffrey L. Taylor, Cincinnati, Ohio, assignor to Standard Textile Co., Inc., Cincinnati, Ohio

Filed Sep. 6, 1983, Ser. No. 529,475
Int. Cl.[4] A61F *13/00*
U.S. Cl. 128—132 D **11 Claims**

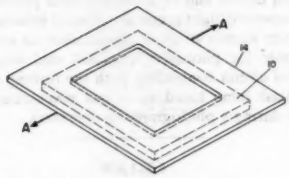
1. In a launderable cloth-like surgical drape having a plurality of layers comprising at least a portion thereof; said plurality of layers comprising a bottom layer and a top layer each made of woven material; means fastening said layers together; and a pair of substantially aligned openings in said layers which define a fenestration in said drape which is useable during surgery; the improvement in which said top layer is made with between 165 and 200 warps and wefts per square inch in a plain weave, each of said warps and wefts being made of a blend of natural material and synthetic material, coating means only on said top layer defining the outside surface thereof, and a fabric tape disposed around said fenestration, said tape being sewn to portions of said layers adjoining said fenestration and once sewn in position having a substantially U-shaped cross-sectional configuration at each location around the periphery of said fenestration, said fastening means being in the form of stitches, said coating means having hydrophobic properties and also serving to resist buildup of static electricity, said top layer when new and with said coating means thereon being substantially impermeable to water flow therethrough prior to laundering thereof and when subjecting said outside surface to a hydrostatic water pressure up to and including about 50 psig.

4,561,435

WOUND DRESSING

James T. McKnight, Pleasantville, N.Y., and Paul Silverstein, Oklahoma City, Okla., assignors to Chesebrough-Ponds, Inc., Greenwich, Conn.

Filed Apr. 4, 1984, Ser. No. 596,514
Int. Cl.[4] A61F *13/00*
U.S. Cl. 128—156 **9 Claims**



1. A wound bandage comprising:

(a) an absorbent pad having a surface facing the wound and a surface facing away from said wound when the bandage is in place on the patient;

(b) A barrier film positioned over the surface of said pad on the surface facing away from said wound, said barrier film being gas permeable and yet substantially impermeable to bacteria;

(c) an adhesive coated film or fabric positioned over and around the periphery of the pad and barrier film, said adhesive coated film or fabric being bonded to the periphery of the barrier film and extending beyond the perimeter of said barrier film and said pad such that when the bandage is applied to the skin of a patient, the portion of the adhesive coated film or fabric extending beyond the perimeter of the pad and barrier film will contact the skin of the patient and form a means of attachment to said skin, said adhesive coated film or fabric having an adhesive underside suitable for removably attaching the adhesive coated film or fabric to said skin;

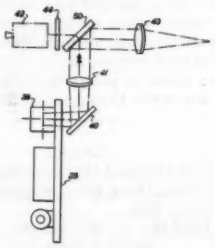
(d) said adhesive coated film or fabric and barrier film together forming a bacteria impermeable barrier.

4,561,436

OPTICAL SYSTEM FOR SURGICAL OPHTHALMIC LASER INSTRUMENT

Charles R. Munnerlyn, Sunnyvale, Calif., assignor to Cooper LaserSonics, Inc., Santa Clara, Calif.

Filed Oct. 28, 1983, Ser. No. 546,397
Int. Cl.[4] A61B *17/36*
U.S. Cl. 128—303.1 **17 Claims**



1. A surgical ophthalmic laser instrument including a binocular microscope, a surgical laser and visible light laser produc-

ing substantially different wave lengths of energy, and an optical system, said optical system comprising:

a. a parallel plate beam splitter arranged for receiving a visible beam from said visible light laser;

b. said parallel plate beam splitter having a half-reflective coating on one side and a full reflective coating on another side and being angled and arranged relative to said visible beam to divide said visible beam into a pair of equal and separated visible beams;

c. an expander positioned in the path of said pair of visible beams for diverging said pair of visible beams;

d. an expander positioned in the path of a surgical beam produced by said surgical laser for diverging said surgical beam;

e. means for combining said diverging surgical beam and said diverging pair of visible beams on a coincident optical path;

f. means for collimating light traveling on said coincident optical path;

g. a mirror arranged on said coincident optical path between a binocular portion of said microscope and an objective portion of said microscope;

h. said mirror having a first coating that reflects substantially all of said surgical beam and is substantially transparent to visible light;

i. spaced-apart regions of said mirror having a second coating that reflects substantially all of both said pair of visible beams and said surgical beam; and

j. said coatings and said mirror being arranged:

(1) for directing said pair of visible beams and said surgical beam through said objective portion of said microscope to converge on the eye of a patient;

(2) for transmitting visible light reflected from said patient's eye through said first coating to be visible with said binocular portion of said microscope; and

(3) for not transmitting any surgical light through said mirror to said binocular portion of said microscope.

4,561,437

TENSIONING DEVICE, PARTICULARLY FOR TIGHTENING BANDS IN MEDICAL PRACTICE

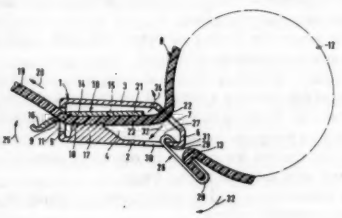
Hansjörg Kirchner, Markgroningen, Fed. Rep. of Germany, assignor to Kirchner & Wilhelm, Fed. Rep. of Germany

Filed May 2, 1984, Ser. No. 606,373

Claims priority, application Fed. Rep. of Germany, May 7, 1983, 3316758

Int. Cl.⁴ A61L *17/00*

U.S. Cl. 128—327 **8 Claims**



1. A device for applying tension around an object such as a person's arm and leg, comprising a tensioning member having a first end portion, a portion adapted to form an object encircling loop, and a second opposite free end portion, a hollow basic member having a rear end wall with an entrance opening and a front end wall with an exit opening, said tensioning member free end portion extending through said entrance opening into the interior of said basic member and out through said exit opening, a backup portion defined in said basic member having a backup surface over which said tensioning member is passed, a lever pressure member pivotally mounted in said basic member over said backup surface and overlying a portion of said tensioning member and having a first arm portion located adjacent the exit opening with a passage therethrough and through which said tensioning member extends and having an opposite second arm portion overlying said tensioning member, said lever pressure member holding said tensioning member after it has been tensioned on said backup surface, said lever pressure member having a portion extending outside of said basic member forming a release button which is liftable to release said tensioning member and anchoring means connected to the first end of said tensioning member and to said basic member holding said tension member to said basic member and means securing said first end portion of said tensioning member to said hollow basic member.

4,561,438

PIEZOELECTRIC TRANSDUCER WITH CURVED SHAFTS

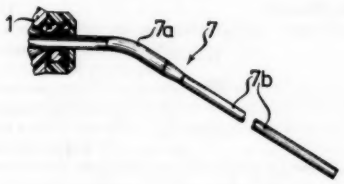
Ludwig Bonnet, Knittlingen, and Ehrenfried Bitrolf, Bretten-Ruit, both of Fed. Rep. of Germany, assignors to Richard Wolf GmbH, Knittlingen, Fed. Rep. of Germany

Continuation of Ser. No. 472,009, Mar. 4, 1983, abandoned. This application Dec. 17, 1984, Ser. No. 682,474

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1982, 8205955[U]

Int. Cl.⁴ A61B *17/00*

U.S. Cl. 128—328 **3 Claims**



1. A piezoelectric transducer for generating ultrasonic oscillations for disintegrating bladder, urethra and kidney stones, of the kind which comprises two piezoelectric discs clamped between two metal elements by means of a tubular bolt utilizable as a flushing passage, and whereof the metal element at the distal side has a curved tubular shaft transmitting the ultrasonic oscillations and joined to the flushing passage of the bolt screwed to it via an end fitting provided with a passage, wherein the proximal part of said shaft has an enlarged internal diameter as far as the area of its curvature and continues from the latter to the distal extremity whilst constricted cylindrically, and wherein the bolt is traversed by a plastics material tube which is joined at one end to the end fitting via a clamping joint and is connected at the other end at the proximal side of the transducer to a flushing pipe via another clamping joint.

4,561,439

THROMBECTOMY CATHETER

David C. Bishop, Shoreham-by-Sea, and Gordon L. Lawrence, Arundel, both of England, assignors to Matburn (Holdings) Limited, London, England

Filed Feb. 4, 1983, Ser. No. 463,910

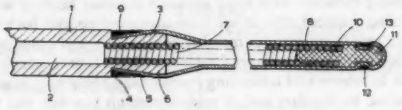
Claims priority, application United Kingdom, Feb. 5, 1982, 8203304

Int. Cl.⁴ A61M *25/00*

U.S. Cl. 128—348.1 **7 Claims**

1. A tubular surgical instrument with a flexible distal end portion, the said instrument comprising a shaft which has a lumen therein, a coiled spring projecting from a distal end of the shaft, a coupling portion at the distal end of the shaft, a portion of the spring being secured in the coupling portion and a balloon, which is inflatable by fluid pressure, applied through

the lumen secured to the spring, said coupling portion having a recess, a shoulder and an annular support surface; the outer surface of said recess flaring forwardly from said shoulder of



said shaft towards said annular support surface; an end of the balloon being received in said recess; a first tie securing said balloon in said recess; and a second tie securing said balloon to said spring and being located forwardly of said first tie.

4,561,440

APPARATUS FOR LASER LIGHT MEDICAL TREATMENT

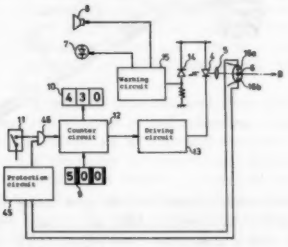
Kiyoshi Kubo, Katano, and Toshio Ohshiro, Tokyo, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma and Japan Medical Laser Laboratory Co., Ltd., Tokyo, both of, Japan

Filed Nov. 16, 1982, Ser. No. 442,083

Claims priority, application Japan, Nov. 18, 1981, 56-185060; Nov. 18, 1981, 56-185061

Int. Cl.⁴ A61N *5/00*

U.S. Cl. 128—395 **12 Claims**



1. An apparatus for laser light medical treatment comprising:

a hand set casing, having an emission hole,

laser light beam emitting means, including a source of laser light, being disposed within said hand set casing and for applying a laser light beam through said emission hole to a skin of a patient for medical treatment,

proximity sensing means provided on both sides of and close to said emission hole for detection of a proximity of said emission hole to said skin of the patient, and

switching means to cut off emission of said laser light beam when said proximity of said emission hole to said skin is not detected by said proximity sensing means.

4,561,441

LIQUID BACK SUPPORT PAD FOR INCLINED SURFACES

Ronald M. Kolodziej, P.O. Box 162, Greenview, Calif. 96037

Filed Aug. 9, 1984, Ser. No. 639,196

Int. Cl.⁴ A47C *7/18, 7/42;* A61F *7/00*

U.S. Cl. 128—403 **25 Claims**

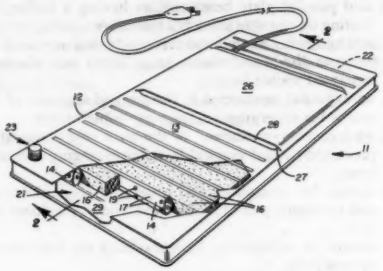
1. A pad comprising, in combination,

a liquid,

a hermetic envelope of a flexible and relatively inelastic material for containing the liquid having two large oppositely facing surfaces and a port through which the liquid may be introduced into and expelled from the envelope,

a plurality of ribs within the envelope securing the facing surfaces thereof in an adjacent relationship,

a sponge-like material received between the ribs within the envelope for providing a wicking structure therein,



means for closing and opening the port, and

means for bleeding vapor from the envelope.

4,561,442

IMPLANTABLE CARDIAC PACER WITH DISCONTINUOUS MICROPROCESSOR PROGRAMMABLE ANTITACHYCARDIA MECHANISMS AND PATIENT DATA TELEMETRY

William Vollmann, N. Lauderdale, and Van E. Mumford, Miami, both of Fla., assignors to Cordis Corporation, Miami, Fla.

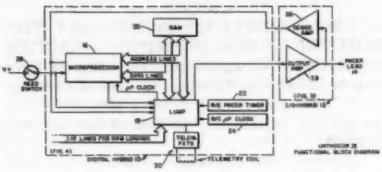
Filed Oct. 17, 1983, Ser. No. 542,889

Int. Cl.⁴ A61N *1/36*

U.S. Cl. 128—419 PG **13 Claims**

MICROFICHE APPENDIX INCLUDED

(2 Microfiche, 83 Pages)



1. An implantable computer-based cardiac pacer comprising

at least one pacer terminal,

output means for issuing an output via said terminal in response to an output command,

a computer including digital storage with stored program means for defining a series of instructions and processing means for fetching and executing said instructions,

said stored program means including means defining a main pacing routine for issuing an output command in accordance with internal timing logic,

clock means connected to said processing means for running said computer means,

presettable timer means clockwise independent of said computer for receiving a preset number from said computer and for producing a zero output at the end of the time period corresponding to said present number,

said stored program means further including means for loading said timer means with a preset number and then issuing a halt command,

clock control means responsive to said halt command for disabling the clock means output for stopping said computer and responsive to either the zero output of said timer means or to a signal originating externally of said pacer for enabling said clock means to restart said computer,

said timer means including a presettable down counter pro-

ducing said zero output and an up counter and means for presetting and enabling said down counter substantially simultaneously with resetting said counter, and

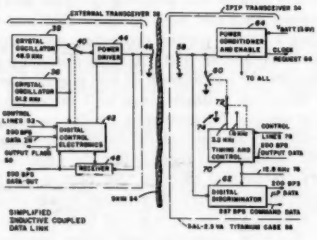
parallel bus means for connecting the present input of said down counter and a set of parallel outputs of said up counter to said computer to transfer parallel binary numbers from said computer to said down counter and from said up counter to said computer on command.

4,561,443

COHERENT INDUCTIVE COMMUNICATIONS LINK FOR BIOMEDICAL APPLICATIONS

Arthur F. Hogrefe, Laurel, and Wade E. Radford, Columbia, both of Md., assignors to The Johns Hopkins University, Baltimore, Md.

Filed Mar. 8, 1983, Ser. No. 473,248
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—419 PG **20 Claims**



1. A communications link for communicating with a programmable medical device adapted to be biologically implanted in a living body, comprising:

an internal receiver located in said programmable medical device;

an external transmitter adapted to be located extracorporeal to said living body;

means for establishing an inductive field between said external transmitter and said internal receiver;

a modulation means, incorporated in said external transmitter, for frequency shift keying said inductive field and for superimposing bit marks on said inductive field, so as to transmit digitally formatted information;

a bit mark detection means, incorporated within said internal receiver, for detecting said bit marks in said inductive field;

a limiter and zero crossing detector means, incorporated within said internal receiver, for detecting the zero crossing of the inductive field;

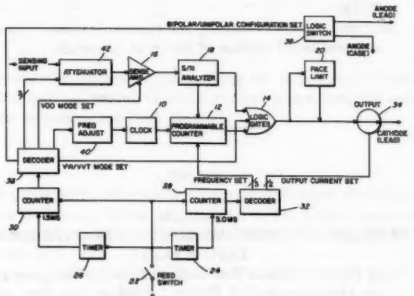
a digital discriminating means, connected in association with said bit mark detection means and said limiter and zero crossing detector means, for counting the number of zero crossings of said inductive field for a preset interval after said bit mark to establish the frequency of the inductive field, wherein said frequency indicates the received binary digit.

4,561,444

IMPLANTABLE CARDIAC PACER HAVING DUAL FREQUENCY PROGRAMMING AND BIPOLAR/LINIPOLAR LEAD PROGRAMMABILITY

John H. Livingston, Coral Gables, and Barry M. Yomtov, Pembroke Pines, both of Fla., assignors to Cordis Corporation, Miami, Fla.

Continuation of Ser. No. 291,430, Aug. 10, 1981, abandoned. This application Jun. 11, 1984, Ser. No. 618,767
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—419 PG **4 Claims**



1. An implantable cardiac pacer having a multi-frequency programming system, comprising

first and second registers,

first means responsive exclusively to an externally generated programming signal at a lower frequency for decoding said lower frequency signal and storing a corresponding number in said first register,

second means responsive exclusively to an externally generated signal at a higher frequency for decoding said higher frequency signal and storing a corresponding number in said second register,

pulse generator means for producing output stimulation pulses at a variable rate, and

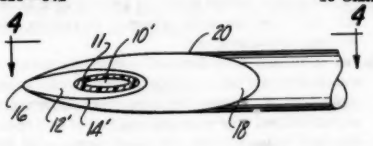
means respinsive to the numbers stored in both said first and second registers for iniquely determining the rate of said pulse generator.

4,561,445

ELONGATED NEEDLE ELECTRODE AND METHOD OF MAKING SAME

Joseph J. Berke, 2063 Long Lake Shore Dr., West Bloomfield, Mich. 48033, and Charles T. Michael, Troy, Mich., assignors to Joseph J. Berke, West Bloomfield, Mich.

Filed May 25, 1983, Ser. No. 498,143
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—642 **10 Claims**



1. An improved needle electrode comprising:

an elongated insulated body of generally circular cross-section having a first end, a second end and a longitudinal axis;

an inner conductive electrode in said elongated body extending from the first to the second end of said body;

a first bevel surface formed at the first end of said body and positioned at an angle relative to the longitudinal axis of the elongated body to form a point at said first end thereby providing an exposed bevel surface area of said inner electrode;

a first peripheral edge being defined as the intersection of the first bevel with the circumference of said elongated body; and

a second bevel surface formed at one end of said first bevel surface remote from said point;

a second peripheral edge defined as the intersection of the second bevel with the circumference of said elongated body;

said second bevel reducing the exposed surface area of the exposed bevel surface of the inner electrode.

4,561,446

ULTRASONIC PROBE WHICH CAN BE INTRODUCED INTO A BODY

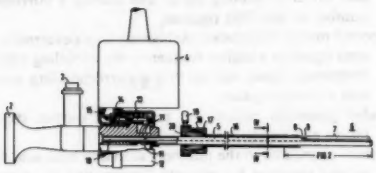
Walter Hetz, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 8, 1982, Ser. No. 433,377

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1981, 3141022

Int. Cl.⁴ A61B *10/00*

U.S. Cl. 128—660 **7 Claims**



1. Apparatus for the examination of a narrow body cavity, such as the bladder, comprising:

(a) a guide tube dimensioned for insertion into said body cavity;

(b) a probe tube having a longitudinal axis and a flat distal end portion, said probe tube having an inner surface, and an outer diameter for sliding into said guide tube;

(c) a linear ultrasonic array disposed along said flat end portion of said probe tube;

(d) an elongated optical insert for guiding light to said cavity and for receiving light reflected therefrom, said insert having a distal end; and

(e) an additional tube disposed within said probe tube and attached to said inner surface thereof parallel to said longitudinal axis for removably receiving said optical insert in said additional tube with said end face of said optical insert disposed adjacent said ultrasonic array, said additional tube having an outer surface defining an open volume in combination with said inner surface of said probe tube; and

(f) a plurality of electrical signal lines disposed in and extending along said open volume in said probe tube, said signal lines being adapted to connect said ultrasonic array to a processing means disposed outside said body cavity, wherein said optical insert illuminates said cavity after being inserted into said further tube.

4,561,447

APPARATUS AND METHOD OF DETECTING ARTERIAL PULSE WAVE

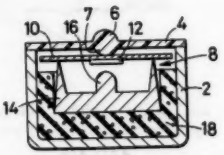
Norio Kawamura, Nagoya; Hifumi Yokoe, and Hideichi Tsuda, both of Kasugai, all of Japan, assignors to Nippon, Colin Co., Ltd., Japan

Filed Jan. 9, 1984, Ser. No. 569,501

Claims priority, application Japan, Jan. 14, 1983, 58-4129[U]; Jan. 17, 1983, 58-5561; Jan. 18, 1983, 58-5148[U]; Jan. 18, 1983, 58-5149[U]; Jan. 18, 1983, 58-6174

Int. Cl.⁴ A61B *5/02*

U.S. Cl. 128—687 **26 Claims**



1. A pulse wave detecting apparatus including a detector adapted to be depressed at its depression surface onto a body member of a subject to detect a blood pressure pulse wave of an artery, said detector comprising:

a housing having portions defining an air chamber which is open at one end thereof, the open end of said housing defining a plane of said depression surface;

a sensing unit received in said air chamber movably in a first direction parallel to a direction in which said detector is depressed onto said body member, said sensing unit including a presser portion protruding away from said depression surface, an elastic member elastically deformable in response to a movement of said presser portion in said first direction, a strain gauge held in contact with said elastic member for generating a pulse wave signal corresponding to an amount of elastic deformation of said elastic member and representing the pulse wave of said artery transmitted through said presser portion, and a support structure partially received in said air chamber of said housing and movable in said first direction, said support structure supporting said elastic member so as to permit elastic deformation thereof; and

elastic support means provided in said housing for resiliently supporting said support structure of said sensing unit depression of said detector onto said body member establishing a depression pressure between said presser portion and said body member in a specified optimal range.

4,561,448

APPARATUS FOR SENSING AND RECORDING BIOPOTENTIAL ELECTRICAL SIGNALS

Gerald L. Buchas, Bristol, Conn., assignor to Colen-Kery, Inc., Burlington, Conn.

Filed Feb. 2, 1984, Ser. No. 576,488

Int. Cl.⁴ A61B *5/04*

U.S. Cl. 128—733 **14 Claims**

1. Apparatus for sensing and recording an ocular standing DC potential, said apparatus comprising:

electrode means, adapted to be connected to the inner and outer canthi of a patient's eye, for sensing the voltage difference across the patient's eye wherein said sensed voltage difference is indicative of eye movement across the eye socket;

a first low pass filter means for filtering the voltage difference sensed by output of said electrode means;

first DC amplification means for amplifying the output of said first low pass filter means;

a second low pass filter means for filtering the output of said first DC amplification means;

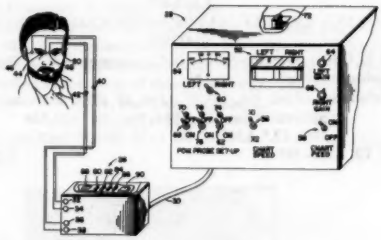
second DC amplification means for amplifying the output of said second low pass filter means;

first selective compensation means connected between the output of said first DC amplification means and the output of said second DC amplification means for producing a first control reference voltage responsive to variations in said sensed ocular standing DC potential caused by electrode means to skin surface contact changes, said second DC amplification means being responsive to said first control reference voltage for maintaining a zero central fixation reference potential;

a third low-pass filter means for filtering the output of said second DC amplification means;

isolator means coupled to the output of said third low pass filter means for transmitting the output of said third low-pass filter means;

third DC amplification means coupled to the output of said isolator means for amplifying the same;



fourth DC amplification means for amplifying the output of said third DC amplification means to provide an output signal representative of said sensed ocular standing DC potential,

second selective compensation means connected between the output of said third DC amplification means and the output of said fourth DC amplification means for producing a second control reference voltage responsive to variations in said sensed ocular standing DC potential caused by at least one of said electrode means to skin surface contact changes and drift in said isolator means output caused by temperature changes, said fourth DC amplification means being responsive to said second control reference voltage for maintaining a zero fixation reference potential, and means for recording the output signal representative of the ocular standing DC potential.

4,561,449

AUDITORY-EVOKED-ACTION-POTENTIAL-MEASURING SYSTEM

Victor L. Hu, San Jose; Larry W. Mauldin, Mountain View, and John J. Lee, Cupertino, all of Calif., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 30, 1982, Ser. No. 445,551
Int. Cl.[4] A61B *5/12*
U.S. Cl. 128—746 **11 Claims**

1. A system for validating a subject's sensory system, the sensory system validating system comprising in combination:

at least one transducer means for applying a stimulus to a subject:

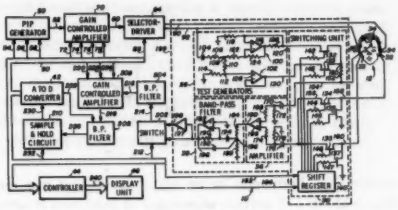
means for use with said transducer means for generating a stimulus at a periodic rate;

first electrode means for detecting an evoked potential:

means for use with said first electrode means for receiving a first evoked-action potential generated by said subject responsive to said periodic stimulus:

second electrode means for detecting an evoked potential:

means for use with said second electrode means for receiving a second evoked-action potential generated by said subject responsive to said periodic stimulus; and



means for automatically identifying the larger one of said first and said second received evoked-action potential and for indicating the level thereof.

4,561,450

ELECTROLYTIC PRESSURE TRANSDUCTION SYSTEM

Gordon H. Bryant, Kailua, Hi., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 3, 1984, Ser. No. 657,438
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—780 **7 Claims**

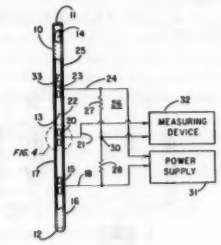


FIG. 4

1. An apparatus for measuring physiological pressures comprising a flexible tube having an open end, a closed end, a hollow interior and an outer surface, an electrode within said tube near said closed tube end, another electrode within said tube spaced from said electrode toward said open tube end, a centrally disposed electrode within said tube generally intermediate of said electrode and said spaced electrode, a pair of series connected electrical resistors, said resistors being coupled to said electrode and said spaced electrode to form a Wheatstone bridge therewith, and a tube portion that is softer and more readily compressed than said flexible tube, said tube portion joining all of said electrodes to said flexible tube and forming a portion of said flexible tube.

4,561,451

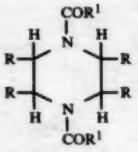
1,4-DIACYLPIPERAZINE FLAVORED SMOKING COMPOSITIONS

William B. Edwards, III, and Yoram Houminer, both of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Aug. 23, 1982, Ser. No. 410,205
Int. Cl.[4] A24B *3/12, 15/38*
U.S. Cl. 131—278 **8 Claims**

1. A smoking composition comprising an admixture of (1) combustible filler selected from natural tobacco, reconstituted tobacco, non-tobacco substitutes, and mixtures thereof, and (2) between about 0.00001 and 2 weight percent, based on the total

weight of filler, of a diacylpiperazine flavorant additive corresponding to the formula:



where R is hydrogen or an alkyl substituent containing between about 1–8 carbon atoms and at least two R substituents are alkyl groups, and R^1 is a hydrocarbyl group containing between about 2–12 carbon atoms.

4,561,452

PROCEDURE FOR PRODUCING LOW NICOTINE TOBACCO BY MEANS OF HIGH PRESSURE EXTRACTION

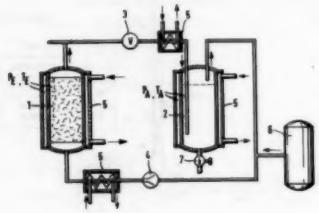
Hans J. Gährs, Düsseldorf, Fed. Rep. of Germany, assignor to Messer Griesheim GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 27, 1984, Ser. No. 644,572

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1983, 3334736

Int. Cl.⁴ A24B *15/24*

U.S. Cl. 131—297 **8 Claims**



1. In a procedure for producing low nicotine tobacco by means of high pressure extraction of the nicotine by means of a compressed gaseous solvent, the improvement being in mixing nitrogen and carbon dioxide with a proportion of 50 to 80 percent nitrogen, and extracting the nicotine at pressures between 250 and 600 bar and at temperatures above 50° C.

4,561,453

TREATMENT OF TOBACCO UNDER PRESSURE IN A CONTINUOUS PROCESS

Ronald D. Rothchild, 106 Rynda Rd., South Orange, N.J. 07079

Filed Dec. 16, 1981, Ser. No. 331,142

Int. Cl.⁴ A24B *3/00, 3/18*

U.S. Cl. 131—304 **17 Claims**

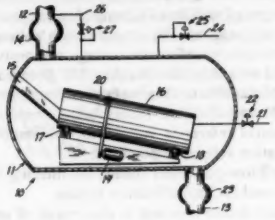
1. A method of treating tobacco under pressure, the improvement comprising the steps of:

a. delivering a continuous flow of said tobacco to a continuously operating entrance lock into a closed chamber containing a pressurized gas,

b. passing said tobacco continuously through said entrance lock into said chamber,

c. transporting said tobacco continuously through said chamber,

d. impregnating said tobacco with said pressurized gas within said chamber, and



e. discharging said impregnated tobacco from said chamber through a continuously operating exit lock.

4,561,454

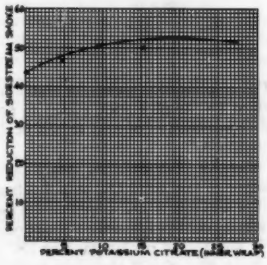
SMOKING ARTICLE HAVING REDUCED SIDESTREAM SMOKE

Hal E. Guess, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco, Winston-Salem, N.C.

Continuation of Ser. No. 339,593, Jan. 15, 1982, abandoned. This application Jun. 15, 1984, Ser. No. 620,538

Int. Cl.⁴ A24D *1/02, 1/18;* D21H *5/16*

U.S. Cl. 131—365 **5 Claims**



1. A smoking article, comprising a tobacco charge, an inner wrapper, and an outer wrapper, said wrappers consisting essentially of a web of cellulosic material and an inorganic filler, wherein one of said wrappers additionally contains an alkali metal salt in a range of about 9–20% by weight.

4,561,455

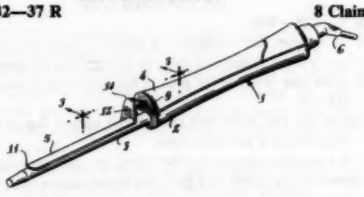
PIVOTED HANDLE HAIR CURLER HAVING SELF-ADJUSTING CLAMP

Witold Pajak, Wayne, N.J., assignor to Conair Corporation, Edison, N.J.

Filed Jul. 7, 1983, Ser. No. 511,631

Int. Cl.⁴ A45D *2/24*

U.S. Cl. 132—37 R **8 Claims**



1. In a hair curler of the type having a pair of handles pivotally connected at one end, a barrel at the outer end of one said

handle and a complementary hair clamp at the outer end of the other said handle, with said barrel and said clamp engaging when said handles are pivoted to their closed position, the improvement including

a spring interposed between and interconnecting said clamp and its respective said handle, said spring having sufficient stiffness to hold said clamp and its respective said handle in the same relative alignment while said curler is open and having sufficient flexibility to adapt its angle when said curler is closed over hair on said barrel to permit a substantially complementary fit of said clamp about said hair and said barrel, said adaptation being dependent upon the amount and positioning of hair on said barrel,

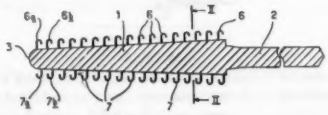
whereby relatively uniform pressure is applied by said clamp to said hair over the length of said barrel.

4,561,456

EYELASH BRUSH AND METHOD AND APPARATUS FOR MANUFACTURING SAME

Jean-Louis H. Gueret, Paris, France, assignor to The Joint Stock Company "L'Oreal" , France

Continuation of Ser. No. 373,172, Apr. 29, 1982, Pat. No. 4,461,312. This application Jan. 11, 1984, Ser. No. 570,034
Claims priority, application France, May 18, 1981, 81 09851
The portion of the term of this patent subsequent to Jul. 24, 2001, has been disclaimed.
Int. Cl.⁴ A45D *40/26*
U.S. Cl. 132—88.7 **12 Claims**



1. In a make-up brush for brushing fibrous elements with a make-up product comprising support means and a plurality of individual bristles fixed to and extending outwardly from the support means, said bristles being obtained by injection molding of a moldable composition, the improvement wherein said bristles are integrally injection molded with, and individually distributed in a regular manner on said support means so that the spacing between two axially consecutive bristles defines an annular bristle free passage to receive a fibrous element so as to obtain a separation of the individual fibrous elements to be brushed by means of the bristles, and wherein at least some of said bristles have enlarged distal ends with said ends being of a size so as not to protrude into said bristle free passages, said bristles being disposed along regular circular sets forming between them a plurality of said bristle free annular passages for the fibrous elements being brushed and said bristles being disposed on said support means in rows regularly distributed around said support means, a bristle of one row being spaced apart from a bristle of an adjacent row by a distance of at least 0.2 mm.

4,561,457

COIN SORTER AND COUNTER

Tsutomu Sasaki, Yokohama, Japan, assignor to Billcon Co., Ltd., Kawasaki, Japan

Filed Mar. 1, 1984, Ser. No. 585,210
Int. Cl.⁴ G07D *3/06*
U.S. Cl. 133—3 G **10 Claims**

1. A coin sorter and counter including:

a main housing;

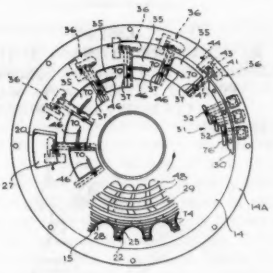
a shaft rotatably carried in said main housing and adapted to be driven by a motor;

a coin pick-up plate secured to said shaft and rotatable therewith, said coin pick-up plate having a plurality of pick-up slots along the periphery of said pick-up plate;

a rotating coin selector plate secured to said shaft and rotatable in concert therewith and in concert with said pick-up plate, said rotating selector plate having a plurality of coin entrances along the periphery thereof;

said rotating selector plate having a plurality of coin pockets, each communicating with one of said coin entrances and each being tapered in width, with the greatest width being at the end thereof connected to said coin entrances, each of said coin pockets having a boomerang shape, with the narrow ends of the pockets being aimed generally in the direction of rotation of said rotating selector plate;

a separator base supported from said main housing;



a fixed separator plate supported from said separator base between said pick-up plate and said rotating selector plate, said fixed separator plate having a window therethrough spaced radially from the axis of said shaft a distance equal to the radial distance of said pick-up slots from the axis of said shaft for coincidence of respective ones of said pick-up slots and said window during rotation of said pick-up plate;

said separator base having a series of selector openings angularly spaced from each other at sequentially shorter radial distances from the axis of said shaft for selective passage of different sizes of coins; and,

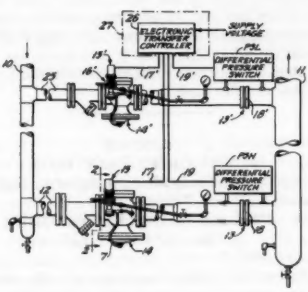
means for collecting the selectively passed coins.

4,561,458

STEAM-METERING METHOD AND APPARATUS

Rudolf H. Hoffmann, Warwick, N.Y., assignor to Spence Engineering Company, Walden, N.Y.

Filed Nov. 19, 1984, Ser. No. 673,022
Int. Cl.⁴ G05D *7/06*
U.S. Cl. 137—2 **14 Claims**



1. In the method of metering the supply of steam over a wide range of demand involving a high-demand line and a low-demand line connected in parallel, wherein each line includes flow-metering means connected to a control valve to govern the transfer of flow to the low-demand line at the low end of the metering range of the high-demand line and to transfer

flow to the high-demand line at the upper end of the range of the low-demand line,

the improvement which comprises

Step (1), delaying the control of any such transfer for a predetermined interval of sustained change in demand, whereby to avoid response to transient changes in demand;

Step (2), initiating the transfer control only after said predetermined interval has run, and

Step (3), effecting the transfer control by predetermined relatively slow progressive change in at least a valve-opening actuation of said control valves, whereby to avoid rapid change in the flow of steam in the line to which flow is being transferred.

4,561,459

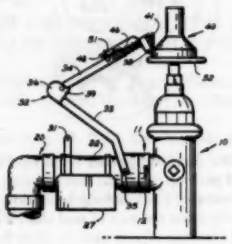
REMOTE FIRE HYDRANT ACTUATOR

William Jackman, E. 2526 Cleveland, Spokane, Wash. 99207

Filed Sep. 17, 1984, Ser. No. 651,174

Int. Cl.[4] E03B 9/04; F16K 31/02

U.S. Cl. 137—291 **13 Claims**



1. An apparatus for controlling operation of a fire hydrant having a side port and a top mounted mechanical valve actuator stem, comprising:

a rigid water supply module;

hydrant coupler means movably mounted on said water supply module selectively fixing it to a side port of a fire hydrant;

hose coupler means on said water supply module for attachment to a fire hose;

conduit means on said water supply module in open communication between said hydrant coupler means and said hose coupler means for directing water from a fire hydrant to an attached fire hose;

a boom movably mounted to said water supply module;

motor assembly means movably mounted on said boom for drivingly engaging the valve actuator stem on a fire hydrant to which the water supply module is fixed; and

control means operably connected to said motor assembly means for selectively causing it to rotate the valve actuator stem to control flow of water from the fire hydrant to an attached fire hose.

4,561,460

DUAL ORIFICE CONTROL

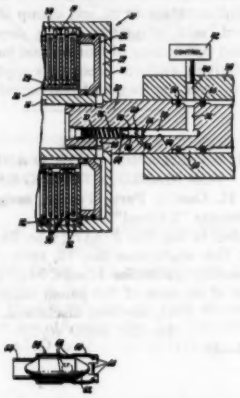
Lyle B. Smith, Westland, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 31, 1985, Ser. No. 696,754

Int. Cl.[4] F16K 17/18

U.S. Cl. 137—493.2 **1 Claim**

1. A dual orifice pressure control valve for controlling the flow of pressurized and exhaust fluid to and from a fluid operated friction device comprising; a feed passage; a friction device control passage; and valve means for controlling the communication of fluid under pressure between said passages including, a stepped diameter bore having three different diameter portions, a valve capsule disposed in one diameter portion and having a clearance therewith to establish a first orifice, check valve means disposed in said valve capsule for preventing direct fluid flow from said feed passage to said control passage, spring means urging said valve capsule into said one bore to seat against the step between the first and second of said three diameters, radial passage means in said capsule for bypassing said check valve means when fluid flow is from said feed passage to said control passage, said capsule being movable against said spring into the third of said three diameters when the fluid pressure in said feed passage is greater than the



fluid pressure in said control passage by at least a predetermined amount, said third diameter, said capsule and said radial passage means cooperating to establish a second orifice for controlling fluid flow from said feed passage to said control passage, said second orifice providing a higher flow rate than said first orifice to provide a fast fill of the control passage, said first orifice establishing a lower flow rate to permit the fluid in said control passage to become equal to the fluid pressure in said feed passage at a rate slower than said fast fill.

4,561,461

LIQUID DISTRIBUTION SYSTEM FOR CHEMICAL ENGINEERING APPARATUSES

Jean-Marie Hubert; Jean-Michel Bauer, and Ralf Abouchar, all of Pagny-sur-Moselle, France, assignors to Le Carbone-Lorraine of Tour Manhattan, France

Continuation of Ser. No. 515,439, Jul. 19, 1983, abandoned, which is a continuation of Ser. No. 333,881, Dec. 23, 1981, abandoned. This application May 10, 1985, Ser. No. 732,814

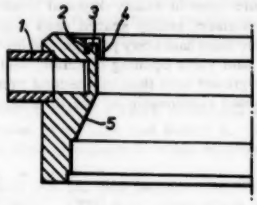
Claims priority, application France, Dec. 24, 1980, 80 27416

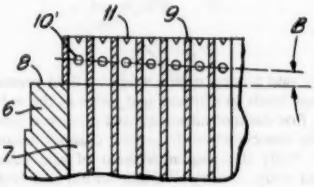
Int. Cl.[4] F15D 1/14

U.S. Cl. 137—561 A **6 Claims**

1. In a liquid distribution system for use in chemical engineering apparatus comprising a liquid dividing means and a horizontal, flat distribution plate having holes and located under the dividing means, an inclined wall between the plate and the liquid dividing means, said liquid dividing means having a groove for incoming liquid and a deflector for causing liquid overflowing said groove to flow along the inclined wall to the periphery of the distribution plate, the holes in said plate being provided with raised portions which themselves contain

perforations or grooves, the improvement that part of the grooves or perforations in said raised portions are located at





variable heights from the periphery of the plate (high position) towards its center (low position).

4,561,462

MULTIPLE CONTROL VALVE SYSTEM

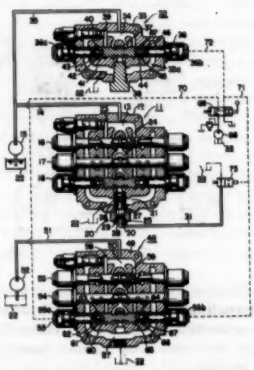
Yutaka Hashimoto, Ayase, Japan, assignor to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 340,382, Jan. 18, 1982, abandoned. This application Jan. 29, 1985, Ser. No. 696,846

Claims priority, application Japan, Jan. 19, 1981, 56-6071

Int. Cl.[4] F15B *13/08, 13/09*

U.S. Cl. 137—596.13 **1 Claim**



1. A multiple control valve system comprising:

a first multiple control valve having an oil inlet chamber connected to an external first pressurized oil pump through a first conduit, oil passages connected to said oil chamber, and a plurality of change-over valves for changing over flow direction of the pressurized oil passing through said oil passages;

a second multiple control valve having an oil inlet chamber connected to an external second pressurized oil pump, oil passages connected to said oil chamber, and a plurality of change-over valves for changing over flow direction of the pressurized oil passing through said oil passages, at least one of said change-over valves being provided with pilot chambers at its both ends;

an additional attachment valve having an oil inlet chamber which is always operatively connected to said first pressurized oil pump through a second conduit in parallel with said first conduit regardless of the shifting of any one of said change-over valves of said first multiple control valve, oil passages connected to said oil inlet chamber, a by-pass passage closed by plugging means, and a change-over valve for changing-over flow direction of the pressurized oil passing through said oil passages, said change-over valve being provided with pilot chambers at its both ends;

a logic valve oil-tightly fitted to said first multiple control valve so as to be communicated with said oil passages formed in said first multiple control valve and provided with a pilot chamber connected to an external oil tank through a conduit;

a remote control valve operatively connected to one pilot chamber of the change-over valve of said attachment valve, one pilot chamber of one of said change-over valves of said second multiple control valve, and the other pilot chamber of the change-over valve of said second multiple control valve through conduits, respectively, and also connected to an external pilot pump, thereby to simultaneously operate the change-over valves of said second multiple control valve and said attachment valve; and

a selector valve disposed to said conduit connecting said pilot chamber of said logic valve and said oil tank, said selector valve being operatively connected to the conduit connecting said pilot chamber of said change-over valve of said attachment valve and said one pilot chamber of said change-over valve of said second multiple control valve.

4,561,463

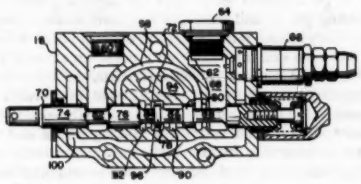
SECTIONAL VALVE HAVING DUAL PRESSURE RELIEF

George A. Brownbill, Alvan Ley, England, and James E. Olsen, Oconomowoc, Wis., assignors to Koehring Company, Brookfield, Wis.

Filed Mar. 23, 1984, Ser. No. 592,936

Int. Cl.[4] F15B *13/08*

U.S. Cl. 137—596.13 **5 Claims**



1. A control valve of the type having upstream and downstream valve elements to govern separate fluid pressure operated systems, an open center passage intersected by said valve elements, and wherein each of said valve elements is movable from a neutral position to an operating position to effect communication of an associated service passage with a pressure fluid supply passage, said control valve being characterized by:

the service passage associated with the downstream valve element receiving pressure fluid from the open center passage in said operating position of the downstream valve element;

a pair of relief valves, one for each of said fluid pressure operated systems and one of said relief valves being set to relieve at a higher pressure than the other relief valve;

means providing a chamber into which said other relief

valve projects to be acted upon by pressure of fluid therein;

means rendered effective by the upstream valve element in said operating position thereof for isolating said other relief valve from fluid pressure then present in the system governed by said upstream valve element so that the pressure in its associated service passage is then monitored solely by said one relief valve;

means on said upstream valve element for closing off the supply of pressure fluid to the downstream valve element via the open center passage in said operating position of the upstream valve element so as to then render the downstream valve element ineffective; and

means rendered operative to effect communication of said chamber with the service passage associated with the downstream valve element via the open center passage whenever the downstream valve element is in its said operating position and the upstream valve element is in its neutral position.

4,561,464

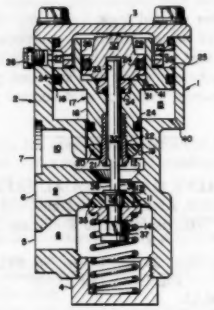
RELAY VALVE

Virgil L. Frantz, Salem, Va., assignor to Roanoke College, Salem, Va.

Filed Nov. 7, 1984, Ser. No. 668,979

Int. Cl.⁴ F15B *13/042*

U.S. Cl. 137—596.18 **6 Claims**



1. A gas actuated relay valve for supplying and exhausting operating gas to and from gas operated means, comprising a valve body having inlet, outlet and exhaust ports, an inlet valve seat between said inlet and outlet ports, an exhaust valve seat between said outlet and exhaust ports, an inlet valve head spring-urged for normally closing said inlet valve seat, an exhaust valve head seatable in and normally spaced from said exhaust valve seat, a springless floating piston and a second piston reciprocable in said body and respectively mounting said exhaust valve head and connected to said inlet valve head, an actuating gas chamber in said valve body, said floating and second pistons having piston heads exposable and responsive in said chamber to actuating gas for respectively seating said exhaust valve head and unseating said inlet valve head, and means enabling said floating piston to respond to a lower actuating gas pressure than said second piston for closing said exhaust valve seat before opening of said inlet valve seat.

4,561,465

AXIAL FLOW PRESSURE REGULATOR

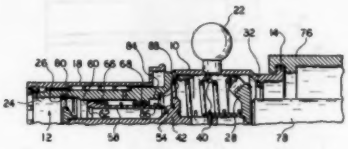
Russell L. Rogers, Munith, Mich., assignor to Aeroquip Corporation, Jackson, Mich.

Filed Sep. 6, 1983, Ser. No. 529,273

Int. Cl.⁴ F16L *37/28*

U.S. Cl. 137—614.05 **6 Claims**

1. An axial flow pressure regulator comprising, in combination, an annular body having an axial flow passage defined therein, a tubular valve movably supported within said passage for axial movement therein in valve opening and valve closing directions, said valve including an exterior surface, first and second pressure faces in axially opposed relationship and an annular gate surface, axially spaced seals sealing the valve exterior surface from said body passage, biasing means biasing said valve in said valve opening direction, said first pressure face having a greater area than said second pressure face and being in opposed relationship to the direction of the force



applied by said biasing means whereby fluid pressure within said passage tends to displace said valve in the valve closing direction, first dashpot means defined upon said tubular valve operatively associated with second dashpot means defined upon said body damping movement of said tubular valve within said body, and a valve seat within said body in axial alignment with said gate surface engageable by said gate surface upon said valve moving its maximum extent in said valve closing direction.

4,561,466

VALVE FOR SUPPLYING FLOW MEDIA

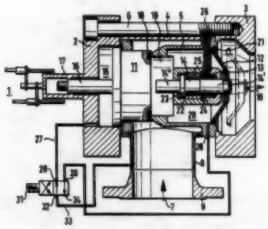
Hans-Georg Fassbinder, Sulzbach-Rosenberg, Fed. Rep. of Germany, assignor to Kloeckner Stahlforschung GmbH, Fed. Rep. of Germany

Filed Nov. 4, 1982, Ser. No. 439,283

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1981, 3143795

Int. Cl.⁴ F16K *31/12*

U.S. Cl. 137—614.21 **16 Claims**



1. A valve for supplying a flow medium to a flow medium pipe which alternatingly carries different flow media, in particular to the flow medium pipe of a converter for treating the contents of the converter with various gaseous flow media, characterized in that

(a) a chamber is provided between a flow medium inlet and a flow medium outlet, which

(b) may be closed by a piston on the side facing the flow medium inlet and

(c) closed by a disk on the side facing the flow medium outlet,

(d) the piston on the side turned away from the chamber and the chamber are each optionally connectable via a separate flow medium pipe with the flow medium inlet and the free atmosphere, respectively, to close the chamber by the piston and evacuate the chamber, or with the free atmo-

sphere and the flow medium inlet, respectively, to open the chamber by the piston,

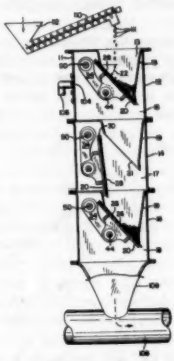
(e) the disk being loaded in a closed position towards the chamber by a spring and a differential piston with a larger effective surface on the side facing the flow medium outlet and a smaller effective surface on the opposite side.

4,561,467

TRIPLE GATE VALVE ASSEMBLY

Michael W. Rouse, West Linn, and Robert L. Thelen, Woodburn, both of Oreg., assignors to Waste Recovery, Inc., Dallas, Tex.

Filed Oct. 26, 1984, Ser. No. 665,171
Int. Cl.[4] F17D *3/00*; G01F *11/28*
U.S. Cl. 137—624.18 **8 Claims**



1. A valve assembly for admitting a flow of small pieces of solid materials under the influence of gravity from a location subject to a first pressure into a space containing a second pressure greater than said first pressure, comprising:

(a) casing means for defining a generally tubular enclosure having an upper inlet end and a lower discharge end;

(b) a selectively openable and sealingly closable top gate defining an entry chamber within said casing means;

(c) a selectively openable and sealingly closable middle gate located below said top gate and defining a second chamber within said casing means below said entry chamber;

(d) a selectively openable and sealingly closable lower gate located below said middle gate, defining a third chamber within said casing means below said second chamber and defining an exit chamber below said third chamber;

(e) a respective pivotably mounted pivot shaft associated with each of said gates, each gate being supported on a gate arm carried on said respective pivot shaft;

(f) respective gate opening lever means fastened to each of said pivot shafts for opening the respective gate associated therewith;

(g) respective gate closing means associated with each said pivot shaft for urging the respective pivot shaft to rotate in a direction moving the respective one of said gates toward a closed position;

(h) a pair of cranks, each having a first end and a second end, each said first end being supported pivotably by a respective crank support bearing located fixedly with respect to said casing and defining parallel axes of rotation of the ones of said cranks;

(i) a connector bar connected pivotably with the second end of each of said cranks at respective locations along said connector bar;

(j) first and second gate opening means carried on said connector bar for acting respectively on said gate opening lever means attached respectively to said pivot shafts of said top gate and said lower gate, to open said top gate and lower gate substantially simultaneously during movement of said connector bar in a first direction;

(k) third gate opening means carried on said connector bar for acting on said gate opening lever means attached to said pivot shaft of said middle gate to open said middle gate during movement of said connector bar in a second direction; and

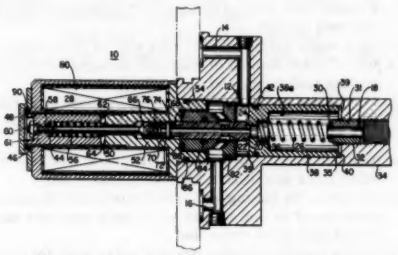
(l) means for periodically reciprocatingly moving said connector bar in said first and second directions.

4,561,468

VALVE FOR USE IN JET ENGINE SYSTEMS AND THE LIKE

Morton A. Kreitchman, South Orange, and Kurt Arnold, West Caldwell, both of N.J., assignors to Valcor Engineering Corporation, Springfield, N.J.

Filed Apr. 19, 1982, Ser. No. 369,664
Int. Cl.[4] F16K *31/12, 31/40*
U.S. Cl. 137—625.5 **1 Claim**



1. A valve formed with a valve chamber and with an entrance port, a first exit port and a relief exit port each of which communicates with said chamber and comprising:

a valve member movably mounted within said chamber,

a pair of valve seats mounted within said chamber for cooperation with said valve member, at least one of said seats being movably mounted,

means for biasing said valve member and at least said movable seat in such a manner that said valve member is normally seated with respect to both of said seats, and

control means actuable for urging said valve member in a direction away from a selected one and towards the other of said seats,

the directions and magnitudes of the respective forces generated by said biasing means and said control means being such that

(1) when said entrance port contains a fluid under a pressure less than a certain operating pressure said valve member normally engages both of said seats, and said fluid is blocked from both of said exit ports, and

(2) when said entrance port contains a fluid under a pressure greater than a certain crack pressure said fluid forces said movable seat in a direction away from the other of said seats, so that said valve member selectively engages one or the other of said seats and said fluid flows out one or the other of said exit ports in accordance with the condition of said control means;

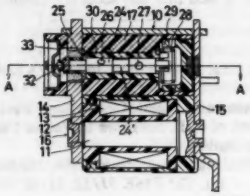
wherein said biasing means is a composite structure comprising a first spring urging said movable seat against said valve member and a second spring urging said valve member against said other seat,

further comprising structure including a third spring and a lost-motion mechanism indirectly connecting said valve member to said second spring for absorbing shock when said valve member moves in response to actuation of said actuating means.

4,561,469
ELECTROMAGNETIC CONTROL VALVE

Motonobu Akagi, Kariya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jan. 23, 1984, Ser. No. 573,220
Claims priority, application Japan, Jan. 31, 1983, 58-15041
Int. Cl.[4] F16K *31/08*
U.S. Cl. 137—625.47 2 Claims

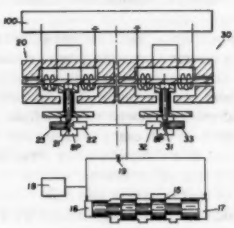


1. An electromagnetic control valve, comprising:
a motor having a solenoid coil wound around a bobbin and a center core formed of magnetic substance and inserted into said bobbin;
a valve body having an inlet port and an outlet port;
a pair of yokes formed of magnetic substance and interconnecting said motor and said valve body;
a valve rotor having a shaft which includes a plurality of bores formed therein communicable with said inlet port and said outlet port;
a rotatable permanent magnet arranged at one end of said valve rotor and disposed in one of said yokes;
a coil spring for biasing said valve rotor in one direction and arranged at an end of said valve rotor opposite said one end of said valve rotor; and
a bearing member inserted into said valve body for rotatably holding said valve rotor and having a plurality of openings respectively communicable with said plurality of bores.

4,561,470
SERVO VALVE CONTROL DEVICE

Jean-Yves L. N. Bezard, Melun; Jean-Marie Brocard, Rubelles, and Christian A. F. Parisel, Combs la Ville, all of France, assignors to Société Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Apr. 18, 1985, Ser. No. 724,357
Claims priority, application France, Apr. 18, 1984, 84 06099
Int. Cl.[4] F15B *13/043, 9/07, 20/00*
U.S. Cl. 137—625.61 12 Claims

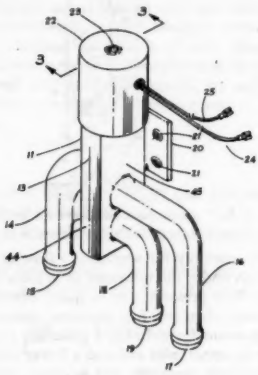


1. A control system for a fluid actuated control member comprising:
(a) a control valve having a movable piston to control the flow of pressurized fluid to and from the control member;
(b) means for generating a servo pressure signal;
(c) connecting means to apply the servo pressure signal to the movable piston of the control valve;
(d) a pair of electrically controlled, fluidic servo valves fluidically connected to the connecting means and forming a variable cross-section restriction in the connecting means so as to control the pressure of the servo pressure signal delivered to the movable piston of the control member;
(e) electronic control means electrically connected to the fluidic servovalves to control the servovalves such that at any given time, one of the servovalves controls the servo pressure signal while the other servovalve remains inert; and,
(f) means connected to the electronic control means to detect a malfunction of the operative servovalve, thereby causing the electronic control means to render the malfunctioning servovalve inert and to render the other servovalve operative to control the servo pressure signal.

4,561,471
WASHING MACHINE RINSE-WATER DIVERTER VALVE

Frank V. Diaz, 207 Galiuro St., Mammoth, Ariz. 85618

Filed May 24, 1984, Ser. No. 613,522
Int. Cl.[4] F16K *11/06, 31/02*
U.S. Cl. 137—870 4 Claims



2. A dump valve for use with automatic clothes washing machines and having an optional feature which allows a user to divert draining rinse water from a normal drain port to an alternate drain port, said feature comprising:
(a) means for diverting the draining of said rinse water from said normal drain port to said alternate drain port comprising a solid, rectangular, plate-like, diverter gate having a suitably located cylindrical opening for normal drain operation of the dump valve, a solid, blocking surface which inhibits flow of water to said alternate drain port when not actuated and which will inhibit flow of water to said normal drain port when actuated, parallel right and left sides with smooth surfaces, a top shoulder surface, a stem portion, said stem portion having a lower stem portion originating at midpoint of said top shoulder surface, a stem collar, an upper stem portion extending from said stem collar and terminating at a stem head having compression slots;
(b) means for housing said rinse water diverting means;
(c) said means for housing said rinse water diverting means including an inlet portion having an inlet port which divides downstream into a normal drain outlet opening and an alternate drain outlet opening, said inlet port, normal drain outlet opening and alternate drain outlet opening being suitably sized to allow proper draining of said rinse water, said inlet portion also having a fin suitably located downstream of said inlet port, said fin having a curved portion which is constructed to curve downward toward said inlet port to provide a break in flow of said

rinse water, said fin further being constructed to provide a wall separation for a suitable distance between said normal outlet opening and said alternate outlet opening toward said curved portion, said normal drain outlet opening and said alternate drain outlet opening originate at said curved fin portion and are sized within said wall separation to be equal to said inlet port;

(d) said means for housing said rinse water diverting means also including an outlet portion having a complementary normal drain inlet opening and a complementary alternate drain inlet opening, said outlet portion normal drain inlet opening terminates downstream at said normal drain port and said outlet portion alternate inlet opening also terminates downstream at said alternate drain port, said inlet port, normal drain port and alternate drain port having ends suitably adapted for connecting a drain hose;

(e) said means for housing said rinse water diverting means further including a junction which forms a gate chamber, said chamber having an inlet portion recessed wall area and a symetrical outlet portion recessed wall area, said inlet portion and outlet portion recessed wall areas are located at their respective normal drain outlet and alternate drain outlet openings and normal drain inlet and alternate drain inlet openings, said recessed wall areas having a shape and size such that said rinse water diverting means adequately fits within said chamber and is allowed to be actuated along defined parallel chamber side walls in an upward and downward fashion to effectuate opening and closing of said normal drain outlet and inlet openings and said alternate drain outlet and inlet openings enclosed within said gate chamber, said gate chamber having a gate stem opening which is not subjected to internal water pressure, said gate stem opening being suitably sized to allow unimpeded upward and downward motion of said rinse water diverting means;

(f) said means for housing said rinse water diverting means also having a mounting bracket with mounting holes for suitable attachment to said automatic clothes washing machine, said mounting bracket further being constructed as a continuous appendage of said housing.

4,561,472

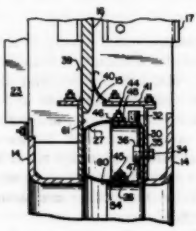
SLIDING BLADE CLOSURE APPARATUS WITH INFLATABLE SEALING RING

Paul L. Dreyer, Allentown, and William R. McLennan, Easton, both of Pa., assignors to Ecolaire Incorporated, Malvern, Pa.

Filed Mar. 20, 1984, Ser. No. 591,588

Int. Cl.[4] F16K *3/36, 49/00*

U.S. Cl. 138—94.3 **10 Claims**



1. In a conduit closure apparatus comprising a frame adapted for connection to a conduit in a position generally in registry with the conduit, a movable blade slidably mounted in the frame, an opening in the frame through which the blade may slide, means for moving the blade back and forth between an open position in which the blade is outside the conduit and a closed position in which the blade blocks the conduit, an inflatable sealing ring mounted in the frame that is operable, when inflated, to press against the face of the blade around the blade's periphery when the blade is in the closed position, thereby creating a seal between the blade and the frame, and means for inflating said sealing ring, the improvement wherein the apparatus has means for pulling a sufficient vacuum on the interior of the sealing ring to cause the ring to collapse and recede from contact with the blade, thereby creating a wider separation between the ring and the blade than if the interior of the ring were at atmospheric pressure; the frame includes a channel in which the blade slides and in which the blade sits when in the closed position; the ring is located inside the channel and is fastened to one of the walls of the channel so that the ring presses against the side of the blade when the blade is in the closed position and the ring is inflated, thereby squeezing the blade between the ring and the opposite wall of said channel; and the ring is capable of being inflated sufficiently to press against the opposite wall of the channel when the blade is in the open position, so as to seal the mouth of the channel.

4,561,473

DOUBLE-PILE LOOM

Kiyoshi Yonehana, and Zenpei Tachibana, both of Kyoto, Japan, assignors to Kawashima Textile Manufacturers Ltd. and Kyocera Corporation, both of, Japan

Filed May 7, 1984, Ser. No. 607,816

Claims priority, application Japan, Jul. 30, 1983, 58-102595[U]

Int. Cl.[4] D03D *39/18*

U.S. Cl. 139—21 **6 Claims**

1. A cutter for use in a double-pile loom not having a grindstone to grind the cutter edge wherein;

said cutter edge of said cutter is of single crystal sapphire sheet; and

said cutter edge is formed in the shape of an arc and provided with an edge having an angle in the range of 7°–27° in a symmetrical configuration between obverse and reverse side of a projecting end of said single crystal sapphire sheet.

4,561,474

WOVEN SLIDE FASTENER STRINGERS

Masaatsu Ofusa, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Division of Ser. No. 441,397, Nov. 12, 1982. This application Nov. 14, 1984, Ser. No. 671,311

Claims priority, application Japan, Nov. 19, 1981, 56-185658; Dec. 29, 1981, 56-197188

Int. Cl.[4] D03D *3/00*

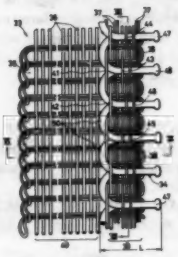
U.S. Cl. 139—384 B **6 Claims**

1. A woven slide fastener stringer comprising:

(a) a woven stringer tape including a longitudinal edge portion woven of a plurality of foundation warp threads and a single foundation weft thread;

(b) a row of continuous filamentary coupling elements disposed on a side of said longitudinal edge portion and spaced longitudinally from each other, each of said coupling elements including a coupling head projecting trans-

versely beyond said longitudinal edge portion, a pair of first and second legs extending from said coupling head in a common direction and spaced from each other in a direction substantially perpendicular to the general plane of said longitudinal edge portion, and a heel portion located remotely from said coupling head and interconnecting one of said first and second legs to another leg of an adjacent coupling element, said first legs being mounted against one side of said longitudinal edge portion, said foundation weft thread having two pairs of picks for each of said first legs with one pair of picks disposed at each side of each said first leg; and



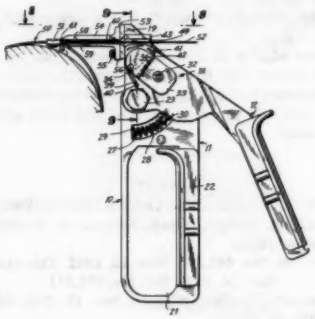
(c) a binding warp thread system securing said row of continuous filamentary coupling elements to said edge portion and including at least one pair of first binding warp threads respectively disposed above and below said heel portions and respectively passing alternately over and under, and under and over, said two pairs of picks, and a plurality of second binding warp threads passing over at least some of said second legs and extending below at least one of said pairs of picks of said foundation weft thread in out-of-phase relation to one another.

4,561,475

UNIVERSAL STRAP TIGHTENING TOOL

Milton Hinden, Rte. 110, Farmingdale, N.Y. 11735

Filed Mar. 30, 1984, Ser. No. 595,516
Int. Cl.⁴ B21F 9/02
U.S. Cl. 140—123.5 **1 Claim**



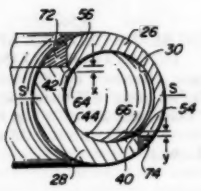
1. In a flat strap tightening tool of the type which comprises a fixed lever member, a pivotal lever member mounted on said fixed lever member for relative pivotal movement between spread and contracted positions about a first pivot axis, spring means interposed between said lever members and urging said members to said spread position, a pawl mounted on said movable lever member for pivotal movement about a second pivot axis parallel to said first pivot axis, said pawl including a clamp surface, a clamp shoulder on said movable lever member in spaced relation to said second pivot axis, pawl spring means biased between said pawl and said movable lever member for urging said clamp surface of said pawl toward said clamp shoulder, a pawl release shoulder on said fixed lever member positioned to engage said pawl and pivot said clamp surface away from said clamp shoulder in said spread position of said levers, the improvement which comprises a first set of at least three strap gripper teeth on the portion of said clamp surface nearest said pawl release shoulder, a second set of at least three strap gripper teeth on said clamp surface spaced further from said pawl release shoulder than said first set of teeth, the crests of said teeth of said second set being located further from said second pivot axis than the crests of the teeth of said first set, the crests of the teeth within each set being in substantial coplanar alignment, the plane defined by said first set diverging from the plane defined by said second set, an elongate guide member mounted on said fixed lever member and extending outwardly beyond said clamp shoulder, said guide member including an elongate spaced parallel pair of fixedly positioned guide bars, one of said guide bars being in substantial axial alignment with the teeth of said pawl, the other of said guide bars being in substantial axial alignment with said clamp shoulder, the space between said guide bars defining a channel having a depth which is parallel to the plane of said clamp shoulder and sized to intimately slidably receive a flat strap to be tightened, said channel depth being normal to the plane of the pawl, said channel opening at the end of said guide member remote from said fixed lever member including a nose formed by only the end of said other guide bar and defining a stop member in the tightening mode of said tool.

4,561,476

TOROIDAL PRESSURE VESSEL

Bela Bunkoczy, Chandler, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Oct. 11, 1984, Ser. No. 659,606
Int. Cl.⁴ B65D 8/22
U.S. Cl. 141—311 R **21 Claims**



1. A toroidal pressure vessel having an axis and comprising first and second annular section that collectively define a hollow toroidal body and are intersecured along a duality of annular joint lines which circumscribe and are spaced apart along said axis, said vessel having, around its cross-sectional circumference, a nonuniform wall thickness configured to provide said vessel with essentially equal internal pressure-induced wall stress around its cross-sectional circumference.

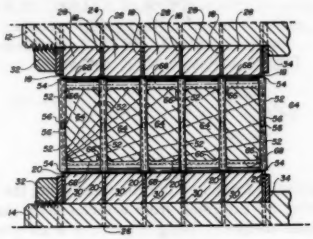
20. A toroidal pressure vessel manufactured by a method comprising the steps of:

(a) providing a first annular member configured to define an axial portion of a hollow toroidal body having a radially inner periphery, a radially outer periphery, and a nonuniform wall thickness being at a maximum thickness adjacent said radially inner periphery and at a minimum thickness adjacent said radially outer periphery, said first annular member having axially offset radially inner and outer annular edge portions;

(b) providing a second annular member configured to define the balance of said hollow toroidal body and having axially offset radially inner and outer annular edge portions; and

(c) forming said hollow toroidal body by respectively intersecuring said radially inner edge portions and said radially outer edge portions of said first and second annular members.

4,561,477
WOODWORKING MACHINE AND BLADES THEREFOR
Edwin H. Zimmerman, R.D. #1, New Holland, Pa. 17557
Filed Jan. 27, 1984, Ser. No. 574,704
Int. Cl.⁴ B27C 9/04
U.S. Cl. 144—41 **9 Claims**



3. A woodworking machine for forming dimensional lumber from cants of larger size and shaping the edges of said lumber comprising in combination:

a. said machine having a longitudinal path of travel for said cants,

b. a pair of parallel horizontal arbors extending transversely to said path and respectively spaced above and below said path and longitudinally offset from each other,

c. supporting and tensioning rollers positioned respectively above and below said path for movement of cants unidirectionally therealong,

d. a plurality of pairs of similar circular combination saw and planer blades each comprising a steel disc of uniform thickness notched substantially radially at circumferentially spaced locations to produce substantially radial fingers each having similar straight edges extending inward from the periphery of said disc,

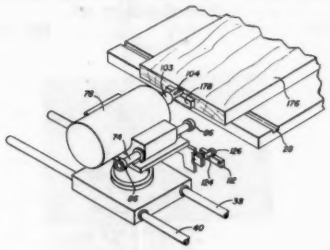
e. a carbide cutting strip of greater width than the thickness of said disc respectively affixed to each straight edge of said fingers and at least one edge of each strip projecting beyond a surface of said disc and sharpened to serve as a radial planing edge,

f. said strips being simlarly gradually tapered with the thicker ends being innermost and the thinner end projecting at least slightly beyond the outer ends of said straight edges of said fingers and being sharp to comprise saw teeth,

g. a plurality of said blades being mounted upon said arbors in similarly spaced relationship with spacing elements therebetween and the blades on one arbor respectively being in the same plane as corresponding blades on the other arbor, the radius of said blades being at least slightly greater than the vertical distances between said arbors and said path of travel, whereby the blades in one plane when rotating in cooperation make a complete cut in a cant between opposite surfaces without interference in view of the longitudinal offset of said arbors, and

h. the opposite sides of the outer terminal ends of said strips being at least slightly curved convexly toward each other to define means forming smooth opposite surfaces on the dimensional lumber pieces formed by said machine as a result of a single pass of a cant therethrough.

4,561,478
ROUTER JOINTING FIXTURE
Leland S. Fields, 1389 Wagon Train Dr., Albuquerque, N. Mex. 87123
Filed Apr. 2, 1984, Ser. No. 595,966
Int. Cl.⁴ B27G 5/06
U.S. Cl. 144—144 R **13 Claims**

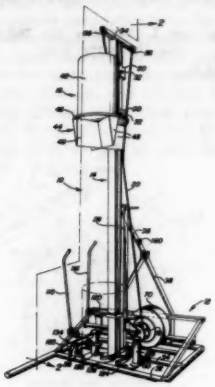


1. A router jointing fixture including first and second relatively stationarily located support portions, said first support portion including means for stationarily supporting a workpiece therefrom in selected position adjacent and relative to a reference plane, a router, router support structure for supporting said router therefrom in position on the side of plane remote from said first support portion and with the rotary shaft of said router disposed normal to said plane and projecting toward the latter, first support means mounting said router support structure from said second support portion for omnidirectional shifting in a second plane paralleling said reference plane, said support structure including second support means mounting said router from said router support structure for adjustable positioning along a path disposed normal to said planes, a template support stationary with said first support portion and a follower stationarily mounted from said router support structure and engageable with a template mounted on said template support for guiding shifting of said router support structure in said second plane, limit means operatively associated with said router and router support structure for adjusting limiting shifting of said router relative to said router support structure along said path toward said reference plane.

4,561,479
MECHANICAL WOOD SPLITTER
Charles M. Burdine, P.O. Box 182, Magnolia, Ark. 71753
Filed Apr. 4, 1984, Ser. No. 596,716
Int. Cl.⁴ B27L 7/00
U.S. Cl. 144—193 B **14 Claims**

7. A mechanical wood splitter comprising a weighted cutter assembly, a guide column for the cutter assembly, means for supporting the column in a vertical orientation means mounting the cutter assembly for reciprocal vertical movement along the column, means for raising the cutter assembly up the column and allowing same to drop from a suitable wood-splitting height onto a log located beneath the cutter assembly, and log gripping means for holding a log in a vertical orientation under the cutter assembly, the gripping means comprising a pair of arcuate log-gripping arms, means mounting the arms for pivotal movement about vertical axes into and out of engagement

with a log, manually operated control means for moving the arms about said axes including resilient means for accommo-



dating expansive forces on a log when gripped by the arms and impacted by the cutter assembly.

4,561,480

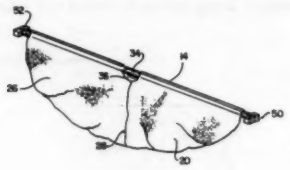
LEAF CADDY

Stephen C. Underwood, 1290 Country Address, Clarkston, Ga. 30021, and John T. Mullen, 3 Randolph Dr., Rome, Ga. 30161

Continuation of Ser. No. 429,849, Sep. 30, 1982, abandoned. This application Sep. 26, 1984, Ser. No. 654,848

Int. Cl.[4] B65D *67/12*

U.S. Cl. 150—49 **6 Claims**



1. A leaf caddy for holding and transporting lawn debris when in use for storage in a minimum of space when not in use comprising: an upper rim of lightweight, strong, flexible material, said rim comprising a pair of first and second thin, flexible rods, each rod having a first end and a second end and an initial, linear configuration, and connectors joining the ends of the rods, each said connector comprising two connector halves and a hinging means located peripherally outwardly of the said rods, said connector halves, said hinging means, and said rods being arranged such that when the connector halves being rotated relative to said rods to form a circular configuration, the resilience of said rods locking the hinging means to prevent any rotation, and when the connector halves being rotated relative to the rods to a collapsible condition, the resilience of said flexible rods returning the rods to their initial linear configuration, a fabric bowl connected to the rim.

4,561,481

TIRE RIM STRUCTURE AND METHOD OF MANUFACTURE

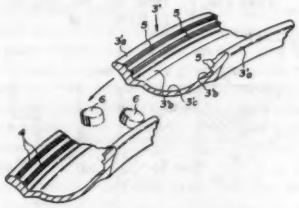
Kazunori Kawauchi, Kanazu, and Junichi Sato, Kaga, both of Japan, assignors to Daido Kogyo, Co., Ltd., Ishikawa, Japan

Division of Ser. No. 384,322, Jun. 1, 1982, abandoned. This application Sep. 17, 1984, Ser. No. 651,645

Claims priority, application Japan, Jun. 11, 1981, 56-90048

Int. Cl.[4] B60B *21/00*

U.S. Cl. 152—379.3 **8 Claims**



1. A method of forming a tire rim comprising the steps of:

(1) forming by extruding from a metal alloy material an elongated member having a concave inner portion and two outer portions including bead seat portions outside said concave portion and ear portions outside said bead portions, said outer portions having a generally smooth outer surface generally in the shape of the outside surface of a tire to be mounted thereon and elongated continuous ridges projecting outwardly from said surface along said outside portions, the ridges being formed by extrusion during said step of extruding;

(2) notching said ridges to form rows of projections for gripping the tires to be mounted; and

(3) after said step of notching, bend-rolling said elongated member to a generally cylindrical shape to form an integral tire rim.

4,561,482

ANTI-BEAD UNSEATING MOUNTING-RIM FOR VEHICLE TIRES

Giuseppe Tavazza, and Franco Bottasso, both of Milan, Italy, assignors to Societa Pneumatici Pirelli SpA, Milan, Italy

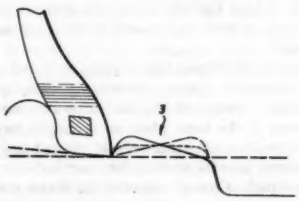
Filed Jun. 7, 1983, Ser. No. 501,818

Claims priority, application Italy, Jun. 11, 1982, 21840 A/82

The portion of the term of this patent subsequent to Mar. 5, 2002, has been disclaimed.

Int. Cl.[4] B60B *25/12*

U.S. Cl. 152—381.4 **10 Claims**



1. A rim for mounting a pneumatic tire, comprising:

a pair of bead seats, each terminating in an axially outer portion with a radially outwardly extending flange;

the axial inner edge of each bead seat defining a cylindrical surface coaxial with the rim axis;

at least one of said bead seats being connected at its axial inner portion to a radially outwardly extending protuber-

ance, the radial height of said protuberance varying from a maximum height to a minimum height with respect to said cylindrical surface in at least two distinct planes orthogonal to the rim axis;

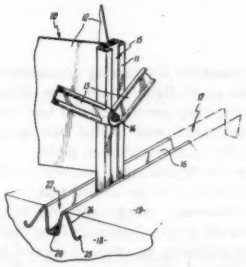
said variation in height being along the circumference of the protuberance and varying from said maximum height to said minimum height and back to said maximum height in a manner so that two areas of maximum height lie in two axial spaced apart distinct planes orthogonal to the rim axis.

4,561,483

GUIDE TRACK FOR A FOLDING BARRIER

Eric F. Calvert, Morton Lodge, United Kingdom, assignor to Bostwick Doors (UK) Ltd., Chelsea, England

Filed Dec. 7, 1983, Ser. No. 558,861
Int. Cl.⁴ E06B *3/92*
U.S. Cl. 160—159 **8 Claims**



1. A guide track and floor structure for a folding barrier comprising:

an elongated member of sheet material having a channel-shaped cross-section received and embedded within said floor for sliding movement of a said folding barrier therein in controlling access to a said floor area on either side thereof,

said guide track including a central base wall forming the bottom of said track, and two side walls extending upwardly and outwardly from either side of said base wall, the said side walls diverging with respect to each other at a small angle to the vertical for receiving therein and laterally confining portions of said folding barrier while the latter may slide longitudinally therealong,

said side walls at the upper ends thereof merging respectively into reversely bent downwardly and outwardly inclined securing flanges extending longitudinally along said side walls and diverging with respect to each other along the length thereof,

the junctures between said side walls and said securing flanges lying substantially in the plane of the floor within which said guide track is embedded,

each said securing flange terminating in a reversely curved upwardly and outwardly directed terminal lip along the length thereof,

the entirety of said securing flanges from said junctures with the side walls, and said terminal lips thereof being fully embedded within said floor to anchor said track,

whereby said guide track channel thereof defined by said base wall and said side walls is in upwardly open relation to receive a folding barrier therein, and said diverging sidewalls provide clearance therefor while said diverging securing flanges and reversely curved terminal lips provide secure anchoring means embedded within said floor for extended service life of said guide track.

4,561,484

METHOD OF TREATING A CAST IRON MEMBER PRIOR TO JOINING TO ANOTHER MEMBER

Masayoshi Usui, Numazu, and Osamu Yonemochi, Nagoya, both of Japan, assignors to Usui Kokusai Sangyo Kabushiki Kaisha, Shizuoka, Japan

Filed Nov. 21, 1983, Ser. No. 554,126
Claims priority, application Japan, Apr. 8, 1983, 58-61661
Int. Cl.⁴ B22D *19/00*
U.S. Cl. 164—101 **4 Claims**

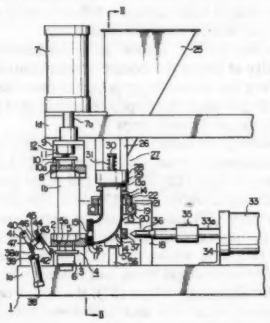
1. A method of joining a cast iron member to another member of cast iron or other metal by welding, soldering or fusing, said cast iron member including at least one surface and further including Fe_3C or graphite disposed adjacent said surface, said method comprising the steps of: dipping the cast iron member in a concentrated aqueous solution of chromic acid for between approximately five minutes and thirty minutes, said solution of chromic acid having a specific gravity of between approximately 1.3 and 1.6 and having a temperature of between approximately 70° C. and 100° C. to remove substantially all of the Fe_3C and graphite from said surface; washing the cast iron member to remove any remaining Fe_3C and graphite from said surface; and joining the surface of the cast iron member to the other member, whereby the removal of the Fe_3C and graphite from the surface of the cast iron member enables said cast iron member to be efficiently and securely joined to the other member.

4,561,485

CORE MAKING MACHINE FOR MAKING HOLLOW CORE

Nagato Uzaki, Toyohashi; Yasutaro Kawamura, Okazaki; Ryoji Kanayama, and Hisashi Harada, both of Toyokawa, all of Japan, assignors to Sintokogio Ltd., Nagoya, Japan

Filed Nov. 9, 1983, Ser. No. 550,148
Claims priority, application Japan, Nov. 12, 1982, 57-199630
Int. Cl.⁴ B22C *15/22*
U.S. Cl. 164—201 **9 Claims**



1. A core making machine for making a hollow core from green sand, comprising:

a horizontally split type die means including a lower die and an upper die movable relatively to the lower die, said lower and upper dies being adapted to define, when they

are jointed to each other, a die cavity, said dies being provided in respective opposing side walls thereof with a first opening and second opening communicating with said die cavity;

a blow tank having a blowing hole and a receiving member provided with a recess, said blow tank being movable relatively to said horizontally split type die means and adapted to blow the green sand into said die cavity through said first opening;

a vent plate movable relatively to said horizontally split type die means to selectively close said second opening so as to permit only blowing air from said blow tank to be discharged through said second opening;

and a stabbing rod movable relatively to said horizontally split type die means so as to be projected into said die cavity to stab green sand filled in said die cavity when said blow tank is spaced from said horizontally split type die means, said stabbing rod being adapted to fit in said recess of said receiving member of said blow tank so as to push said blow tank thereby to bring said blowing hole of said blow tank into close contact with said first opening of said horizontally split type die means.

4,561,486

METHOD FOR FABRICATING POLYCRYSTALLINE SILICON WAFER

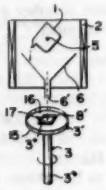
Yasuhiro Maeda; Takashi Yokoyama, and Shinichi Yagihashi, all of Sapporo, Japan, assignors to Hoxan Corporation, Sapporo, Japan

Filed Apr. 29, 1982, Ser. No. 373,039

Claims priority, application Japan, Apr. 30, 1981, 56-66021; Nov. 18, 1981, 56-184812; Mar. 23, 1982, 57-46068; Mar. 23, 1982, 57-46069; Mar. 23, 1982, 57-46070; Mar. 23, 1982, 57-40728[U]; Mar. 29, 1982, 57-50543

Int. Cl.⁴ B22D *13/00*

U.S. Cl. 164—118 **1 Claim**



1. In a method of fabricating a polycrystaline silicon wafer, comprising the steps of:

(a) placing molten silicon in a dispensing zone located over a centrifugal zone having a defined rising outer peripheral wall (15) which encloses said zone;

(b) pouring molten silicon in a predetermined measured quantity at about the center of said centrifugal zone; and,

(c) cooling the silicon layer which is over the surface of said centrifugal zone; the improvement in said method consisting of the additional steps of:

(d) disposing a turntable (3') in said centrifugal zone under said dispensing zone, said turntable (3') having said rising peripheral wall (15) at about the outer peripheral edge;

(e) attaching a wafer tray (17) onto the turntable (3'), said wafer tray (17) having a rising peripheral edge (8'), the zone peripheral wall (15) being higher than said peripheral edge (8'), said wafer tray (17) being somewhat smaller than the centrifugal zone, and having a bottom plate with a wafer-forming surface (3''), the space between the tray peripheral edge (8') and said zone peripheral wall (15) defining a recovery zone (16), so that said molten silicon liquid from said dispensing zone is poured substantially onto the center of said wafer tray (17); and,

(f) radially outwardly flowing the molten silicon liquid by centrifugal force created by the rotation of the turntable (3') and hence the wafer tray (17), so that excess molten liquid overflows the tray peripheral edge (8') and falls and solidifies in the recovery zone so that silicon base material can be recovered and reused.

4,561,487

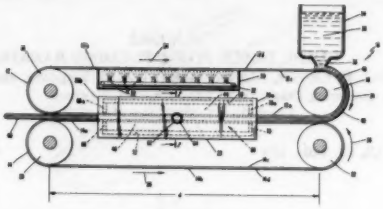
VACUUM BELT HUGGER FOR CASTING OF RIBBON

John R. Bedell, Madison, N.J., assignor to Electric Power Research Institute, Palo Alto, Calif.

Filed Mar. 4, 1983, Ser. No. 471,995

Int. Cl.⁴ B22D *11/06*

U.S. Cl. 164—253 **10 Claims**



1. In an assembly for casting continuous metal ribbon, an apparatus for controllably cooling the ribbon, comprising:

(a) a continuously moving chilled belt traveling at a predetermined speed, said chilled belt including an external surface for receiving molten metal;

(b) means for depositing a molten metal ribbon onto the external surface of the chilled belt;

(c) a continuously counter-rotating hugger belt disposed adjacent the external surface of the chilled belt, said hugger belt including an external control surface traveling a predetermined distance in substantially parallel relationship to said external surface of said chilled belt at said predetermined speed; and

(d) means for creating a partial vacuum between external surfaces of the chilled and hugger belts along at least a portion of the predetermined distance and allowing the ambient pressure along the interior surfaces of the belts to urge the belts together with the ribbon interposed therebetween to control the ribbon and enhance heat transfer relationship between the ribbon and the belts.

4,561,488

METHOD OF AND APPARATUS FOR CONTINUOUSLY CASTING METAL STRIP

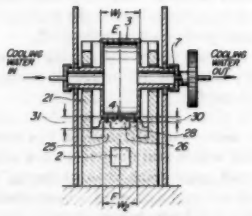
Eisuke Niyama, Katsuta, and Tatsushi Aizawa, Ibaraki, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 18, 1983, Ser. No. 467,809

Claims priority, application Japan, Feb. 19, 1982, 57-24487

Int. Cl.⁴ B22D *11/06*

U.S. Cl. 164—463 **13 Claims**



1. A method of continuously casting a metal strip comprising: a first step of supplying a molten metal, by circulating said molten metal by an externally applied force, into a casting

cavity defined between an outer peripheral surface of a rotating cooled casting roll and an inner peripheral surface having a substantially U-shaped cross-section of a refractory inner vessel disposed to oppose to said outer peripheral surface with a predetermined gap left therebetween, said molten metal being supplied in such a manner that it flows down in the same direction as the direction of rotation of said cooled casting roll, so that said molten metal contacts only with the outer peripheral surface of said cooled casting roll over a predetermined circumferential length while simultaneously causing a part of the circulated molten metal to overflow laterally through the lateral gaps formed between the side edge portions of said inner peripheral surface of said inner vessel and the outer peripheral surface of said cooled casting roll in the direction perpendicular to the direction of rotation of said cooled casting roll, thereby to solidify said molten metal on the outer peripheral surface of said cooled casting roll to form a metal strip; and a second step of pulling said metal strip upwardly while separating the same from the outer peripheral surface of said cooled casting roll after said metal strip has come out of contact with said molten metal.

4,561,489

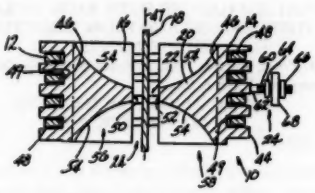
FLUX CONCENTRATOR

Jonathan A. Dantzig, Hamden, and John V. Patton, New Haven, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 361,940, Mar. 25, 1982, Pat. No. 4,522,790. This application Jan. 17, 1985, Ser. No. 692,135

Int. Cl.⁴ B22D *27/02*

U.S. Cl. 164—467 **6 Claims**



1. A process for generating a relatively strong magnetic field for casting a material comprising the steps of:

generating a primary magnetic field being weaker than said strong magnetic field;

receiving the material to be acted upon by said strong magnetic field in a casting zone;

shielding said primary magnetic field from said casting zone;

generating said strong magnetic field within said casting zone, the improvement comprising the step of:

providing a concentrator body having a hollow interior for shielding said primary magnetic field; providing a flux concentrator within said hollow interior having a slot extending therethrough and forming said casting zone, said concentrator body and said flux concentrator being joined to each other and split into at least two sections; and moving one section with respect to the other section to vary the size of said slot while the strong magentic field is being generated in said casting zone.

4,561,490

METHOD OF, AND APPARATUS FOR, CONTINUOUSLY CASTING A CURVED STRAND USING A CURVED RIGID DUMMY BAR

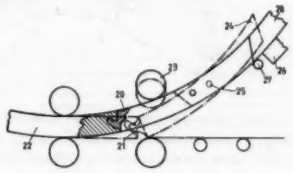
Carlos R. Navarro, Barcelona, Spain, assignor to Concast Service Union AG, Zurich, Switzerland

Filed Jul. 5, 1983, Ser. No. 510,964

Claims priority, application Switzerland, Jul. 16, 1982, 4342/82

Int. Cl.⁴ B22D *11/08*

U.S. Cl. 164—483 **8 Claims**



1. A curved continuous casting installation for casting strands, comprising:

means defining a strand path of travel for a cast strand moving in a predetermined direction of travel;

a curved rigid dummy bar having a curved longitudinally axis;

a dummy bar head articulated to said dummy bar;

said summy bar head being articulated to said dummy bar for performing a pivotal movement about an axis extending transversely with respect to said predetermined direction of travel of the cast strand;

said dummy bar head being provided with a permanent coupling member disengageable from the cast strand by performing said pivoting movement of the dummy bar head;

a straightener machine;

an engageable decoupling roller arranged at the region of said straightener machine;

said engagable decoupling roller being movable towards said pivotable dummy bar head to act upon the same with a force sufficient to disengage said permanent coupling member from said cast strand such that during the casting operation said dummy bar head is pivoted outwardly from an axial position thereof with respect to the dummy bar and away from said curved longitudinal axis of said dummy; and

said force with which said engageable decoupling roller acts upon said pivotable dummy bar head being adapted to initiate a straightening operation for the cast strand before said engageable decoupling roller engages the cast strand.

4,561,491

INVESTMENT CASTING

John D. Slack, Matlock, England, assignor to Rolls-Royce Limited, London, England

Filed Nov. 14, 1984, Ser. No. 671,310

Claims priority, application United Kingdom, Dec. 7, 1983, 8332566

Int. Cl.⁴ B22C *9/24, 9/04*

U.S. Cl. 164—516 **5 Claims**

1. A method of manufacturing a finished mould for use in the investment casting of an object comprising the steps of:

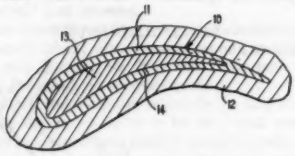
providing at least a portion of a first component with a thermally decomposable surface modifying coating having a texture to facilitate keying of wax thereto and decomposable into minimal particulate decomposition products when heated;

moulding a second component made from wax into abutting relationship with said first component and said at least a

portion of said thermally decomposable surface modifying coating to form a pattern;

coating said pattern with a refractory material to define a mould;

heating said mould at a temperature sufficient to melt the



wax of said second component and sufficient to thermally decompose said surface modifying coating into said minimal particulate decomposition products; and

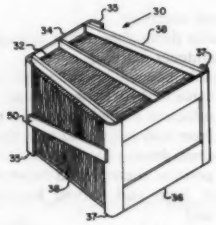
pouring said molten wax and said minimal particulate decomposition products of said surface modifying coating out of said mould.

4,561,492

ELEMENT BASKET ASSEMBLY FOR HEAT EXCHANGER

Kenneth O. Bellows, Wellsville, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed Jan. 22, 1985, Ser. No. 692,963
Int. Cl.⁴ F28D *19/04*
U.S. Cl. 165—8 **2 Claims**



1. An element basket assembly for a heat exchanger comprising:

a. a plurality of heat transfer element plates juxtaposed in a stacked array;

b. first and second end plates disposed at opposite ends of said stacked array of heat transfer element plates in abutting relationship therewith;

c. at least one first side strap interconnecting said first and second end plates, said at least one first side strap disposed along one side of said stacked array of heat transfer element plates so as to run diagonally from a higher location on said first end plate to a lower location on said second end plate; and

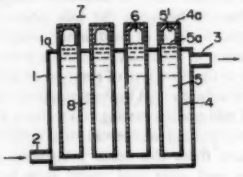
d. at least one second side strap interconnecting said first and second end plates, said at least one second side strap disposed along the other side of said stacked array of heat transfer element plates opposite the side along which said at least one first side strap is disposed, said at least one second side strap running diagonally from a lower location on said first end plate to a higher location on said second end plate.

4,561,493

HEAT-STORING APPARATUS

Michio Yanadori, Hachioji; Seigo Miyamoto, Takahagi, and Kelichi Koike, Matsudo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 9, 1982, Ser. No. 416,276
Claims priority, application Japan, Sep. 11, 1981, 56-142305; Jul. 30, 1982, 57-131919
Int. Cl.⁴ F28D *17/00*
U.S. Cl. 165—10 **20 Claims**



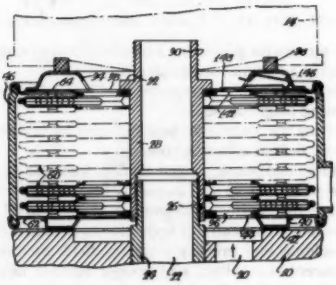
1. In a heat-storing apparatus for storing and releasing heat by phase change of heat-storing material of latent heat type comprising a heat-storing vessel, and a heat-storing material of latent heat type filled in the heat-storing vessel, the improvement comprising the heat-storing material containing a gelling agent and a nucleating agent, a fluid flow passage being provided in the heat-storing vessel in thermal contact with the heat-storing material for passing a fluid for giving heat to the heat-storing material for heat-storing and for passing a fluid for withdrawing heat from the heat-storing material, a low temperature part having a lower temperature than another part being provided at a part of the heat-storing vessel, and the heat-storing material containing the gelling agent and nucleating agent being provided in a solid state at least at the inner wall of the low temperature part in the heat-storing vessel, and wherein the heat-storing material is sodium thiosulfate pentahydrate, and contains starch as the gelling agent and naphthalene as the nucleating agent.

4,561,494

HEAT EXCHANGER WITH BACK TO BACK TURBULATORS AND FLOW DIRECTING EMBOSSMENTS

Donald J. Frost, Racine, Wis., assignor to Modine Manufacturing Company, Racine, Wis.

Filed Apr. 29, 1983, Ser. No. 489,705
Int. Cl.⁴ F28F *3/06, 9/22*
U.S. Cl. 165—76 **11 Claims**



9. A heat exchanger for exchanging heat between two fluids comprising:

a plurality of heat exchange units in stacked relation, each unit comprising a pair of spaced plates joined together and sealed at their peripheral edges;

means for spacing each of said units from the adjacent unit;
means establishing fluid communication between said units; and
a housing containing said stack, said housing having a stack receiving opening, said housing further having an inlet and an outlet;
said opening having an edge defined by a bead;
a cover member for said opening one edge including a peripheral groove facing said bead and having the same configuration thereof so as to be received on said bead;
means securing said cover on said opening with said groove received on said bead, and
sealing means in said peripheral groove and sealingly engaging said peripheral groove and said bead.

4,561,495

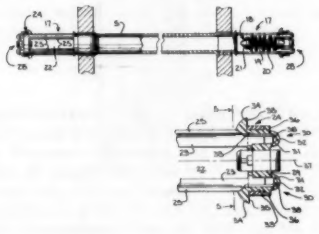
ALIGNMENT OF BASKET RETAINER CLIPS FOR HEAT EXCHANGER TUBE CLEANING ELEMENTS

Walter J. Baron, Mequon, Wis., assignor to Water Service of America, Inc., Milwaukee, Wis.

Continuation-in-part of Ser. No. 533,143, Sep. 16, 1983, abandoned, and a continuation-in-part of Ser. No. 533,134, Sep. 16, 1983, abandoned. This application Aug. 31, 1984, Ser. No. 645,824

Int. Cl.⁴ F28G *1/12*

U.S. Cl. 165—95 **3 Claims**



1. For use in a heat exchanger having a housing containing a plurality of fluid flow tubes through which tube cleaning elements are propelled between elongated baskets at the tube ends, and wherein said baskets include longitudinally extending slots terminating in outer end edges, a removable retainer for mounting to an outer basket end and comprising:

(a) a central body portion of molded plastic and with said body portion having a longitudinal axis,

(b) a plurality of flexible circumferentially spaced clips integrally attached to said central body portion, said clips including: a first longitudinally outwardly extending leg which merges into a reverse bend loop forming a clip base, and which in turn merges into a second longitudinally inwardly extending leg,

(c) means on said second leg for latching with the outer end slot edges of the basket upon insertion of said retainer thereinto,

(d) and means disposed within said clip base adjacent said reverse bend loop for joining said first and second legs so that said second leg is normally disposed in parallelism with said first leg and said axis.

4,561,496

HEAT EXCHANGER FOR THE COOLING OF GASES, PARTICULARLY FROM THE SYNTHESIS OF AMMONIA

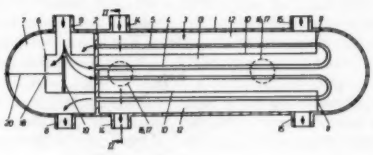
Wolfgang Kehrer, Berlin, Fed. Rep. of Germany, assignor to Borsig GmbH, Berlin, Fed. Rep. of Germany

Filed Dec. 23, 1983, Ser. No. 564,095

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1983, 3302304

Int. Cl.⁴ F28F *27/02*

U.S. Cl. 165—103 **3 Claims**



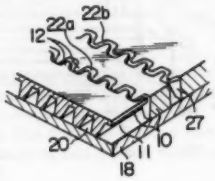
2. Heat exchanger for the cooling of hot gases, particularly from the synthesis of ammonia, through evaporating water, comprising: a shell and a tube plate; a single bundle of tubes; tubes inserted into said tube plate and arranged in said shell; said tubes being bent into U-shape; an exit chamber and an entry chamber for the gases to be cooled adjoining said tube plate; stubs for supply and removal of water and connected to said shell; separating walls at least partially enclosing exit limbs of all tubes arranged within said shell to form a closed pre-heater chamber; said pre-heater chamber having separate connections for its own water throughflow; a portion of said bundle of tubes with said exit lying within one chamber and the remaining portion of said bundle of tubes being enclosed by the other chambers; said separating walls being connected with said tube plate and said shell and dividing the heat exchanger into two pre-heater chambers extending in longitudinal direction and a middle space lying there between; said tubes being flowed through by hot gases to be cooled, said entry chamber and said exit chamber feeding and removing said hot gases, respectively; said exit chamber being welded to a rim of said tube plate and having an exit stub; an entry stub being passed through said exit chamber into said entry chamber; said entry chamber being arranged concentrically with said exit chamber and being connected with said tube plate so that always one limb of said tubes opens into said entry chamber; one of said separate connections being an inlet stub in proximity of said tube plate and another one of said connections being an outlet stub at an opposite end of the heat exchanger for flowing cooling medium in counterflow direction to said hot gases through said pre-heater chambers; said middle space having inlet stub means passed through a lower part of said shell and having outlet stub means passed through an upper part of said shell, passage of cooling medium through said pre-heating chambers being separated from passage of cooling medium through said middle space, water being pre-heated in said pre-heating chambers for conducting to an external means; said middle space receiving water evaporating partially at entry limbs of said tubes; said entry chamber having an opening producing a connection to said exit chamber in a wall lying parallel to said tube plate; a slide displaceable from outside through a rod penetrating said opening and being arranged within said entry chamber in a prolongation of said entry stub, said slide wiping over said opening of said entry stub into said entry chamber, a proportion of entering gases being conducted directly into said exit chamber depending on a setting of said slide for setting a desired exit temperature in exiting gas.

4,561,497

HEAT TRANSFER SURFACE AND MANUFACTURING METHOD FOR SAME

Tadakatsu Nakajima, Ibaraki; Wataru Nakayama, Kashiwa; Takahiro Daikoku; Heikichi Kuwahara, both of Ibaraki; Akira Yasukawa; Katsuhiko Kasuya, both of Ibaraki; Kazuaki Yokoi, Ibaraki; Hideo Nakae, Tokyo, and Hiromichi Yoshida, Hitachi, all of Japan, assignors to Hitachi, Ltd. and Hitachi Cable Ltd., both of Tokyo, Japan

Filed Dec. 14, 1983, Ser. No. 561,070
Claims priority, application Japan, Dec. 17, 1982, 57-220081
Int. Cl.[4] F28F *13/18*
U.S. Cl. 165—133 **5 Claims**



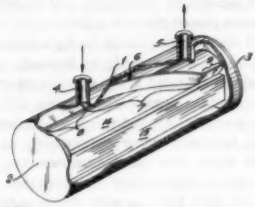
1. A heat transfer surface assembly having groups of cavities and groups of restricted openings in an outer surface region of a heat transfer wall, said heat transfer assembly comprising a laminate of a plurality of elongate thin plate members which are arranged side-by-side with each other on a base member of said heat transfer wall and which are laminated to said base member; each of said elongate thin plate members including a number of elongate cavities which are laterally arranged with respect to the length of the plate members and are parallel with each other, said elongate cavities being closed at an outer surface portion of said plate members and having openings at both ends; the adjacent cavities of adjacent plate members being in communication with each other via openings at adjacent ends between said side-by-side plates members; said outer portions of the plate members having a plurality projections that extend outwardly from the plate members in a direction generally parallel to the elongate cavities, spaces between the adjacent projections of adjacent plate members defining the groups of restricted openings and said restricted openings allowing entry and egress of fluids into and out of said cavities.

4,561,498

INTERCOOLER WITH THREE-SECTION BAFFLE

Jeffert J. Nowobilski, Orchard Park, and Arun Acharya, East Amherst, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 21, 1984, Ser. No. 591,858
Int. Cl.[4] F28F *9/22*
U.S. Cl. 165—160 **18 Claims**



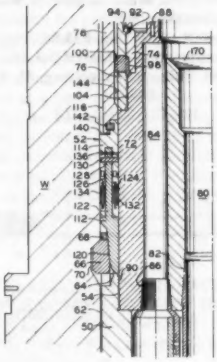
1. An apparatus for heat transfer with a stream at elevated pressure comprising:
(a) a longitudinal shell;
(b) end plates on each end of said longitudinal shell to form an enclosure;
(c) inlet and outlet ports spaced axially along said longitudinal shell;
(d) a baffle plate within said enclosure oriented diagonally with respect to said longitudinal shell between said inlet and outlet ports;
(e) a tube bundle within said enclosure adapted for flow of heat exchange fluid through the tubes and a cover sheet between the tube bundle and the diagonally oriented baffle plate; and
(f) baffle plate and sections connected respectively to each end of said baffle plate, extending respectively from the vicinity of said inlet and outlet ports to said end plates, and oriented at an angle in the range of equal to or greater than 0 degrees with respect to said longitudinal shell and opposite in sign from the angle of the diagonal baffle thereby bending backwards with respect to the orientation of the diagonal baffle.

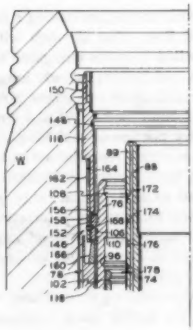
4,561,499

TUBING SUSPENSION SYSTEM

Paul C. Berner, Jr., and Eugene L. Brickman, both of Houston, Tex., assignors to Vetco Offshore, Inc., Ventura, Calif.

Filed Aug. 13, 1984, Ser. No. 639,713
Int. Cl.[4] E21B *23/00, 33/043, 43/013*
U.S. Cl. 166—85 **27 Claims**





1. A tubing hanger comprising:
a hanger body including an inner body portion having a suspension means to support a longitudinally extending tubing string and a lower body portion having a trans-

versely disposed landing shoulder, said body mounting a radially movable wellhead locking means;

fixed middle sleeve means mounted to said hanger body in concentric relation therewith, said middle sleeve means including a radially positionable retainer means;

inner sleeve means concentric with said middle sleeve means and longitudinally movable relative thereto to control the position of said fixed middle sleeve means retainer means;

a retrievable outer sleeve assembly releasably captured by said middle sleeve means retainer means and concentric with said middle and inner sleeve means, said outer sleeve assembly comprising actuator means for causing radial movement of said wellhead locking means, said outer sleeve assembly further comprising a radially engageable sealing means and a sleeve locking means to secure said outer sleeve assembly to said middle sleeve at a selective relative longitudinal position, said wellhead locking means, said sealing means, and said sleeve locking means being actuable by a longitudinally acting load applied to said outer sleeve assembly.

16. A running tool for a tubing hanger comprising:

an inner body having a central longitudinally extending passage therethrough;

an outer actuating sleeve concentric with said inner body and longitudinally moveable relative thereto, said actuating sleeve carrying a first latch means for generally radial engagement and having a catch means;

second latch means engageable with said catch means to secure the actuating sleeve at a longitudinal position relative to said inner body;

release slide means to actuate said second latch means;

hydraulically controlled movement means for effecting relative longitudinal movement between said actuating sleeve and inner body;

first locking means mounted to said inner body and radially extendable for radial locking engagement; and

second locking means mounted to said inner body and radially extendable for radial locking engagement.

4,561,500

METHOD OF ENHANCING OIL RECOVERY BY USE OF EXOPOLYMER-PRODUCING MICRO-ORGANISMS

Bradley G. Thompson, Edmonton, and Thomas R. Jack, Calgary, both of Canada, assignors to Nova/Husky Research Corporation Ltd., Alberta, Canada

Continuation-in-part of Ser. No. 405,371, Aug. 5, 1982, Pat. No. 4,460,043. This application Dec. 16, 1983, Ser. No. 561,985
Claims priority, application Canada, Aug. 15, 1983, 433952
The portion of the term of this patent subsequent to Jul. 17, 2001, has been disclaimed.
Int. Cl.[4] E21B *43/22*
U.S. Cl. 166—246 **51 Claims**

1. In the enhanced recovery of mineral oil by supplying a drive fluid to an oil-bearing underground formation, a method of reducing permeability of zones in the formation having higher permeability than surrounding zones comprising:

(a) injecting into the underground formation microorganisms capable of producing substantially insoluble exopolymer by the action of an enzyme system in the presence of a trigger compound and capable of growing under conditions of oil-bearing underground formations, such that said microorganisms accumulate in said higher permeability zones, said microorganisms being injected in an aqueous medium substantially free of said trigger compound; and

(b) injecting the trigger compound into the underground formation so as to enhance enzymatic production of exopolymer by said microorganisms, whereby the exopolymer reduces the permeability of said higher permeability zones.

4,561,501

SURFACTANT OIL RECOVERY SYSTEMS AND RECOVERY OF OIL THEREWITH

James E. Shaw, and Jerry E. Pardue, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 28, 1983, Ser. No. 508,709
Int. Cl.[4] E21B *43/22*
U.S. Cl. 166—273 **15 Claims**

1. A method for immiscibly displacing oil from a subsurface earth formation containing the same, comprising:

(a) injecting into said subsurface earth formation an aqueous surfactant system wherein the surfactant consists of at least one alkaline earth metal carboxylate having at least 7 carbon atoms and consisting of an alkaline earth metal carboxylate radical and an aliphatic hydrocarbon radical having at least one alkyl side chain, in an amount between about 0.1 and 10% by weight, a cosurfactant comprising an alcohol having at least 5 carbon atoms per molecule, in an amount between about 0.1 and 10% by weight, and an electrolyte, in concentrations and proportions sufficient to form an immiscible two-phase mixture with said oil, comprising an upper phase predominating in said surfactant, said cosurfactant and said oil and a lower phase predominating in water and said electrolyte;

(b) thereafter injecting into said subsurface earth formation a drive fluid to drive said surfactant system through said subsurface earth formation and displace a significant amount of said oil; and

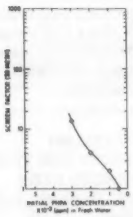
(c) withdrawing the thus displaced oil from said subsurface earth formation.

4,561,502

OIL RECOVERY PROCESS USING A POLYACRYLAMIDE GEL

Charles J. Norton; David O. Falk, both of Denver, Colo., and Alfred D. Hill, Austin, Tex., assignors to Marathon Oil Company, Findlay, Ohio

Continuation-in-part of Ser. No. 337,640, Jan. 7, 1982, abandoned. This application Dec. 9, 1983, Ser. No. 560,056
Int. Cl.[4] E21B *43/16;* C09K *3/00*
U.S. Cl. 166—274 **12 Claims**



1. A process for recovering hydrocarbons from a subterranean hydrocarbon-bearing formation comprising: cross-linking a water-soluble undried partially hydrolyzed polyacrylamide in an aqueous solution with a cross-linking agent to produce a cross-linked polyacrylamide gel; and injecting the gel into the formation via a well and thereafter recovering hydrocarbons from the formation.

4,561,503

H_3PO_4/HF SILICEOUS FORMATION TREATING COMPOSITION AND METHOD

Tony C. T. Wong, Calgary, Canada, assignor to Amerigo Technology Limited, Calgary, Canada

Filed Nov. 9, 1982, Ser. No. 440,262
Claims priority, application Canada, Nov. 9, 1981, 389713
Int. Cl.⁴ E21B *43/27*
U.S. Cl. 166—307 **32 Claims**

1. A composition for treatment of siliceous formations, comprising an aqueous solution having a phosphoric acid concentration in the range of from about 10 to about 30% by weight, to which is added at least one flourine donor compound in an amount to provide a generated hydrofluoric acid concentration in the range of from about 1 to about 7% by weight.

12. A method of treating a siliceous formation containing a calcareous component comprising introducing into said formation a composition comprising an aqueous solution having a phosphoric acid concentration in the range of from about 10 to about 30% by weight, to which is added at least one fluorine donor compound in an amount to provide a generated hydrofluoric acid concentration in the range of from about 1 to about 7% by weight.

13. A method according to claim 12, wherein in the composition the added fluorine donor is selected from the group consisting of ammonium fluoride and ammonium bifluoride.

14. A method according to claim 13, wherein in the composition the added fluorine donor is ammonium bifluoride.

26. A method according to claim 14, wherein in the composition the aqueous solution is an aqueous solution having a phosphoric acid concentration of about 20% by weight, from about 0.6 to about 5 weight % of a highly polar surface active agent which is a citric acid-monoethanolamine elimination reaction product characterized by a visible absorption spectrum which displays an increasing extinction coefficient from the red to the near U.V. with some structure, an absorption maximum at 475 nm, a plateau from 460 nm to 465 nm, an absorption maximum at 450 nm and extinction coefficients as follows:

$\epsilon_{475}=0.325$ l/gm.cm

$\epsilon_{462}=0.379$ l/gm.cm

$\epsilon_{450}=0.509$ l/gm.cm,

an effective amount of a ferrous metal corrosion inhibitor, and an amount of a crystal modifying agent sufficient to control crystal growth, minimize crystal agglomeration and minimize crystal adhesion to the formation, said crystal modifying agent being selected from the group consisting of polyacrylate polymers and blends of such polymers with phosphonic acid or a phosphonate, and the ammonium bifluoride is added in an amount to provide a generated hydrofluoric acid concentration in the range of from about 2 to about 5% by weight and including at least one additional step selected from the group consisting of preflushing and afterflushing the formation with fluorine-free acid or salt solution.

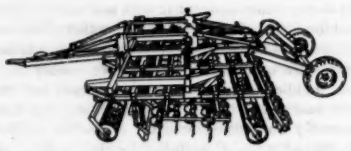
4,561,504

FLEXIBLE TINE HARROW FOR THE PREPARATION OF SEED BEDS

Helge H. Andersen, Soro, Denmark, assignor to Kongskilde Koncernselskab A/S, Soro, Denmark

Filed Apr. 20, 1984, Ser. No. 602,334
Claims priority, application Denmark, Apr. 26, 1983, 1850/83
Int. Cl.⁴ A01B *63/22, 63/32*
U.S. Cl. 172—142 **2 Claims**

1. A flexible tine harrow for seed bed preparation, comprising a main frame with hitch means for coupling to a tractor, a plurality of intermediate frames suspended beneath main frame and each provided with earth engaging roller means, a harrow tine frame associated with each of said intermediate frames and adjustably suspended therefrom, and a set of harrow tines clamped in each of said harrow tine frames and having shares lying in the same level, each of said intermediate frames being connected with said main frame through a front link and a rear adjustable telescopic stay biased to extension, respectively, said



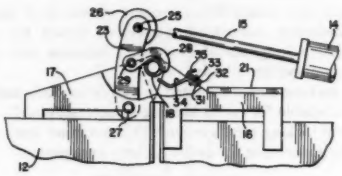
link and said stay being hingedly connected to said intermediate frame and extending, respectively, from their hinge points under such angles that their longitudinal centerlines intersect approximately in the level of said shares.

4,561,505

HINGE MECHANISM FOR FOLDING TOOL BAR ASSEMBLY INCLUDING HOOK ENGAGEABLE OVER PIVOTAL CONNECTION

Gerald E. Williamson, Macomb, Ill., assignor to Yetter Manufacturing Company, Colchester, Ill.

Filed Jun. 9, 1983, Ser. No. 502,489
Int. Cl.⁴ A01B *73/04*
U.S. Cl. 172—776 **8 Claims**



6. A hinge mechanism for a folding tool bar assembly including first and second hinge brackets, a hinge pin pivotally connecting said hinge brackets, a hydraulic cylinder and operating rod for actuating said hinge brackets between retracted and extended positions, a pair of roller wheels on said operating rod, a hinge lever having one end pivotally mounted to the second hinge bracket, and another end pivotally mounted to said operating rod, and a hook mechanism pivotally mounted to said hinge lever intermediate said one end and said another end and engageable over said hinge pin.

4,561,506

PIVOTING DRIVER WITH CHANGEABLE BITS

Scott E. Booker, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 11, 1983, Ser. No. 512,864
Int. Cl.⁴ B25J *11/00*
U.S. Cl. 173—39 **5 Claims**

1. A tool for driving bits comprising:

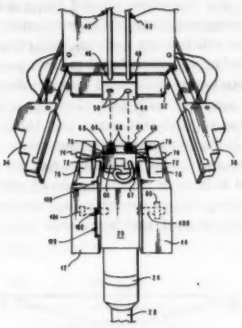
a pair of stationary blocks;

an air driver located between said blocks and pivotably connected thereto;

first means in one of said pair of blocks for selectively pivoting said air driver between two positions, said first means including a pneumatically actuated rack and pinion drivingly connected to the air driver;

second means in the other of said pair of blocks for locking said air driver in a plurality of angular positions, said second means comprising orthogonal pairs of grooves, one of each pair provided in parallel edges of the block,

each groove being of the same width as the air driver, on the side of the block adjacent the air driver; and



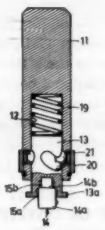
third means for resiliently urging the block into contact with the air driver in either of its two positions.

4,561,507

TOOL ADAPTER

Mou T. Liou, No. 33, Hsi-Fu Rd., Da-Li Hsian, Taichung Hsieng, Taiwan

Filed Mar. 6, 1984, Ser. No. 586,737
Int. Cl.[4] B25D *15/00*
U.S. Cl. 173—93.7 **3 Claims**



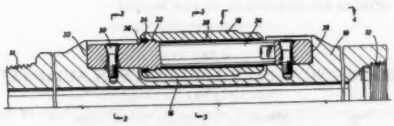
1. In an impact tool including an impact receiving member having a first axial bore provided at its one end; and a transmitting unit having a rotary member which has its one end mounted in said first bore, a cam mechanism for transmitting the axial motion of said impact receiving member to said rotary member as a rotary motion, the improvements wherein said rotary member is provided with a second axial bore at its other end, said second bore having a portion of a first lateral dimension and a deeper and coaxial portion of a second smaller lateral dimension, and a coupling body which is detachably fittable in said second bore and having first and second portions of differently cross-sections dimensions, said first and second portions of said coupling body being capable of being fitted in said first and second portions, respectively, of said second axial bore, said first portion being greater in length than said second portion, whereby said first and second portions of said coupling body can be changeably fitted in said second bore for presenting two differently sized coupling ends for insertion into the coupling heads of tool bits.

4,561,508

ROLLER-REAMER

William R. Garrett, Coldspring, Tex., assignor to Hughes Tool Company, Houston, Tex.

Continuation-in-part of Ser. No. 174,515, Aug. 1, 1980, abandoned, and a continuation-in-part of Ser. No. 246,210, Mar. 21, 1983. This application Feb. 16, 1984, Ser. No. 580,689
Int. Cl.[4] E21B *10/30, 10/22*
U.S. Cl. 175—347 **7 Claims**



1. A roller-reamer unit subcombination for securing into a body of a roller-reamer borehole drilling apparatus, comprising:

(a) a roller-reamer and a shaft held in radial alignment by a radial bearing and in axial alignment by a thrust bearing;

(b) seal means between said roller and said shaft to retain a lubricant between said radial and thrust bearings and to exclude drilling fluid from said radial and thrust bearings;

(c) a lubricant reservoir and pressure volume compensator within said shaft;

(d) fluid communication means between said radial and thrust bearings and said lubricant reservoir;

(e) securing means on the ends of said shaft for directly attaching said shaft to the body with an interference fit; and

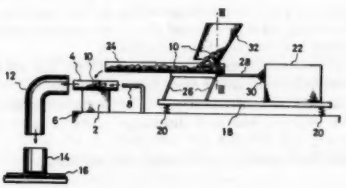
(f) means to apply a large magnitude outwardly applied radial force to remove said shaft from its interference fit within the body.

4,561,509

COMBINATION WEIGHING MACHINE

Sakuichi Sakakibara, Kobe; Yoshiaki Tokuda, Kyoto; Tamio Nagai, Suita; Yoshitaka Mikata, Himeji, and Kazuhiro Nishide, Kobe, all of Japan, assignors to House Food Industrial Company, Limited and Yamato Scale Company, Limited, both of, Japan

Filed Dec. 20, 1983, Ser. No. 563,629
Int. Cl.[4] G01G *19/22, 19/00*
U.S. Cl. 177—25 **3 Claims**



1. A combination weighing machine adapted for delivery of quantities of articles measured by weight, with each quantity being of an acceptable weight relative to a reference weight, comprising:

a set of weighing scales arranged side-by-side, each adapted to weigh a plurality of loose unpackaged articles constituting a fraction of said quantity and each adapted for unloading of said articles therefrom to contribute to a delivery;

a set of article conveyors, one for each weighing scale, arranged in side-by-side generally parallel relation for conveying said loose unpackaged articles along generally

parallel paths to said weighing scales, each article conveyor having inlet and outlet ends, the outlet end of each article conveyor being disposed above a respective weighing scale for discharge of loose unpackaged articles from the conveyor into said scale;

a set of air jets, one for each scale, for blowing loose unpackaged articles off said scales in a generally horizontal direction generally parallel to said paths; and

chute means adjacent said weighing scales having a relatively large inlet for receiving loose unpackaged articles blown off said scales and an outlet through which said articles are adapted to be discharged.

4,561,510

DISPERSING SUPPLY APPARATUS IN AUTOMATIC WEIGHING SYSTEM

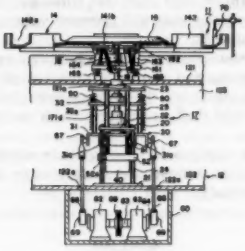
Yukio Sugioka, Shiga, and Masami Kono, Kyoto, both of Japan, assignors to Kabushiki Kaisha Ishida Koki-Seisakusho, Kyoto, Japan

Filed Jan. 20, 1984, Ser. No. 572,316

Claims priority, application Japan, Jan. 20, 1983, 58-007155[U]

Int. Cl.⁴ G01G *13/22, 19/22*

U.S. Cl. 177—84 **7 Claims**



1. A dispersing supply apparatus, for an automatic weighing system having a base, for dispersively supplying articles to a plurality of hoppers arrayed in a circle surrounding the dispersing supply apparatus, comprising:

a platform supported by the base of the automatic weighing system;

a vibrating unit disposed on said platform;

a dispersing bowl, connected to said vibrating unit so that the dispersing bowl is subject to helical vibration, having an upper side, a central portion and a circumferential wall portion which is provided with a plurality of discharge ports at positions corresponding to the hoppers;

a dispersing table positioned above the central portion of the upper side of said dispersing bowl;

drive means, disposed on said platform, for rotating and vertically oscillating said dispersing table;

a plurality of shutters disposed between respective ones of the hoppers and said discharge ports of said dispersing bowl; and

means for opening and closing said shutters.

4,561,511

TORSION LOAD CELL

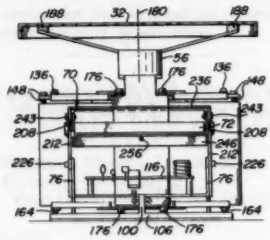
James M. Stuart, Malvern, Pa., assignor to Malvern Scale Company, Malvern, Pa.

Continuation of Ser. No. 510,692, Jul. 5, 1983, abandoned. This application Nov. 9, 1984, Ser. No. 670,659

Int. Cl.⁴ G01G *3/00, 1/24, 3/14*

U.S. Cl. 177—225 **5 Claims**

1. An electronic scale comprising a pair of beam assemblies interconnected by torsion means, platform means attached to one of said beam assemblies and arranged to move upon receipt of some material thereon, said beam assemblies being very rigid in the direction of applied force when a material is placed on said platform means for minimizing non-torsional deflections of said assemblies, one of said beam assemblies being a stationary unit and the other of said beam assemblies being mounted for movement through flexure members that are free of relatively movable bearing surfaces, said others of said beam assemblies including a support bracket having a section closely adjacent said stationary unit, said support bracket being attached to and movable with said platform means and being movable relative to said stationary unit, electronic position sensing means including a member coupled to move with the platform means and said support bracket for producing an electrical signal indicative of the weight of said material, said torsion means comprising a torsion means comprising a torsion bar coupled both to said stationary unit and to said closely



adjacent section of the support bracket through torsional force-transmitting, non-slip coupling means including welds, said torsion bar having a portion located in the region between the stationary unit and said adjacent section of the support bracket and constituting the twist situs of said bar, said portion of said bar extending for a sufficiently short distance to substantially eliminate non-torsional deflections in said bar, and thereby substantially eliminate the heating and cooling effects associated with such non-torsional deflections in said bar, whereupon movement of said platform means upon receipt of said material thereon causes said portion of the bar, through the coupling of the bar to the stationary unit and the closely adjacent section of the support barcket, to twist about an axis of said bar to produce torsional movement detectable by said sensing means, with said sensing means producing an electrical signal indicative of the weight of said material.

4,561,512

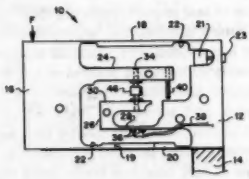
LOAD CELL SCALE OF UNITIZED CONSTRUCTION

Herbert Tramposch, Riverside, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed May 25, 1984, Ser. No. 613,994

Int. Cl.⁴ G01G *3/08, 3/14*

U.S. Cl. 177—229 **7 Claims**



1. A unitized load cell comprising:

a vertically extending fixed support member,

a vertically extending movable support member horizontally spaced relative to said fixed support member,

a pair of links each of which is integral with said fixed sup-

port member and said movable support member to form a parallelogram,

a load beam extending from said movable support member,

a sensing beam extending from said fixed support member and located vertically below said load beam,

an opening in said sensing beam,

an opening located in said load beam, and

a cylindrical flexure connector having a first portion of one end received within the opening of said load beam and a second portion of said one end abutting said load beam and the other end having a first portion received within said opening of said sensing beam and a second portion abutting said sensing beam,

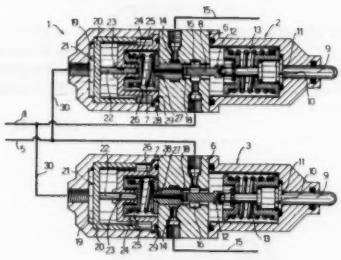
whereby a load may be transferred from said load beam to said sensing beam by placing said cylindrical flexure connector under compression.

4,561,513

STEERING DEVICE FOR A HYDROSTATIC-DRIVE VEHICLE, IN PARTICULAR A CRAWLER-MOUNTED EARTH-MOVING MACHINE

Rino O. Barbagli, Borgaretto, and Gaetano Marras, Vinovo, both of Italy, assignors to Fiat Allis Europe S.p.A., Turin, Italy

Filed Jun. 19, 1984, Ser. No. 622,119
Claims priority, application Italy, Jul. 11, 1983, 67751 A/83
Int. Cl.[4] B62D *11/04*
U.S. Cl. 180—6.48 **8 Claims**



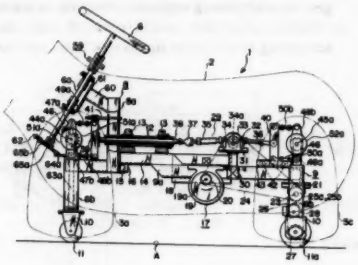
1. A steering device for a hydrostatic-drive vehicle provided with a pair of rolling trains and for preventing simultaneous counter-rotation of both of said rolling trains on said vehicle which comprises a pair of pressure-regulating steering valves which control a pilot pressure for controlling the rotation direction and speed of a respective rolling train on said vehicle, each of said steering valves comprising a body, a shuttle located in said body which moves axially against first flexible means and which is activated by mechanical control means, the body of each of said steering valves being provided with an end chamber housing an axially-moving piston which cooperates with shouldering means for said first flexible means and to shift against said first flexible means the said shouldering means, means for exerting on an active surface of the piston of each of said steering valves, a control pressure depending on the pilot pressure which is regulated by the other steering valve, and stroke limiting means for stopping said pistons in such an axial position that, when one of said pistons is activated by said control pressure, the respective steering valve determines a constant pilot pressure for stopping the respective rolling train.

4,561,514

AMUSEMENT VEHICLE

Kazuo Yamada, Tokyo, Japan, assignor to Togo Japan, Inc., Tokyo, Japan

Filed Dec. 26, 1984, Ser. No. 686,192
Claims priority, application Japan, Feb. 16, 1984, 59-27450
Int. Cl.[4] A63G *19/20*
U.S. Cl. 180—8.6 **10 Claims**



1. An amusement vehicle comprising:

a front frame including a front leg frame and front wheels attached to the lower portion of the front leg frame, said front wheels being adapted to change their course from side to side;

a rear frame including a rear leg frame and rear wheels attached to the lower portion of the rear leg frame;

a hollow shaft coupling the front and rear frames so as to be rockable in the rolling direction, thereby holding the front and rear wheels in contact with the ground;

drive means including a motor for rotating at least one of the front and rear wheels;

a pair of front imitation legs arranged in association with the front leg frame and swingable in the longitudinal direction of the vehicle;

a pair of rear imitation legs arranged in association with the rear leg frame and swingable in the longitudinal direction of the vehicle;

swinging means for driving the imitation legs, said swinging means including a power transmission shaft movably passed through the hollow shaft and adapted to drive the front and rear imitation legs in association with one another through the medium of the power transmission shaft;

steering means for changing the course of the front wheels as required; and

a body shell covering the front and rear frames.

4,561,515

STEERING POWER TRANSMITTING EQUIPMENT

Akio Hashimoto, Kawasaki, and Tomio Yasuda, Kasukabe, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jul. 6, 1984, Ser. No. 628,301
Claims priority, application Japan, Sep. 1, 1983, 58-161018
Int. Cl.[4] B62D *5/04*
U.S. Cl. 180—79.1 **2 Claims**

1. Steering power transmitting equipment comprising:

a steering gear mechanism including at least a steering wheel, an upper steering shaft, a lower steering shaft, a steering gear box having a gear housing and a steer shaft for transmitting steering power from said steering wheel to said steer shaft and a middle steering shaft between said upper and lower steerng shafts;

a torque sensor connected to said upper shaft for detecting the torque applied through said steering wheel to said upper shaft;

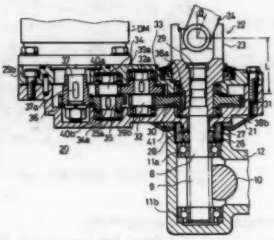
a driven gear coaxially connected to one of said lower steering shaft and said steer shaft, said lower shaft being an

output shaft part of a joint connected to said middle steering shaft and said driven gear being coaxially fixed to said output shaft part, and said steer shaft being disconnectably coupled to said output shaft part;

a bracket fixed to said gear housing;

an electric motor coupled to drive said driven gear, said motor being held by said bracket, said electric motor including reduction gears and a reduction gear housing rotatably mounting said reduction gears, said reduction gear housing being supported by said bracket;

an electric controller which controls said electric motor according to the input signal sent from said torque sensor;



said gear housing having an internally threaded axial bore in which said steer shaft is rotably inserted, and a guide ring with external threads connected to said internal threads of said axial bore, a central through hole in said guide ring in which said steer shaft is inserted and an inner guide surface formed coaxially at one end of said central through hole, said reduction gear housing having a guide part with a through hole in which said steer shaft is inserted, said guide part being inserted into said inner guide surface of said guide ring.

4,561,516

CONTROL VALVE FOR VEHICLE POWER STEERING SYSTEMS

Arthur E. Bishop, P.O. Box 936, Crows Nest, New South Wales, Australia, and John Baxter, Chatwood, Australia, assignors to Arthur E. Bishop, Mosman, Australia

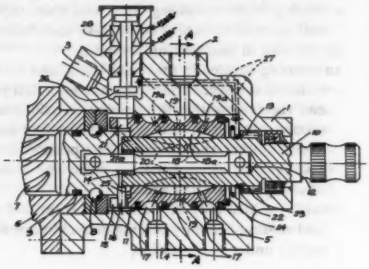
Filed Aug. 31, 1984, Ser. No. 646,241

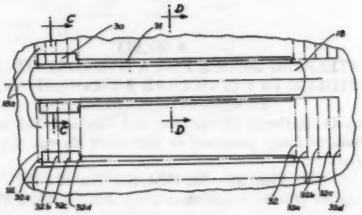
Claims priority, application Australia, Aug. 8, 1984, PG6458

Int. Cl.⁴ B62D *5/08*; F15B *13/14*; F16K *11/12*

U.S. Cl. 180—142 **9 Claims**

1. A hydraulic control valve for a power assisted steering system for a vehicle, the valve comprising a sleeve member having a bore in the surface of which is a first set of longitudinally extending grooves separated by lands, a valve core fitting closely within the bore of the sleeve member and relatively rotatable therein, a second set of longitudinally extending grooves, also separated by lands, on the surface of the valve core, each groove of the first set lying opposite to a land of the second set, the width of some at least of the grooves or lands varying along their lengths, an axially extending torsion bar connecting the valve core to the sleeve member, means to conduct hydraulic fluid under pressure into and out of said grooves, relative rotation between the valve core and the sleeve member acting to vary the effective width and therefore the area of orifices defined by adjacent edges of opposing grooves and lands, and so to control the restriction to flow of hydraulic fluid within the valve and thus the power assistance provided to the system, characterised in that the sleeve member and the valve core are relatively movable axially to change the length and thus further change the area of said orifices





available for the flow of hydraulic fluid and thereby alter the degree of assistance provided.

4,561,517

CRUISE CONTROL MODULATOR

Carl W. Hilton, and Harold L. Bullard, both of Muskegon, Mich., assignors to Return on Investment Corporation, Muskegon, Mich.

Division of Ser. No. 204,066, Nov. 4, 1980, Pat. No. 4,407,385.

This application Mar. 17, 1983, Ser. No. 476,134

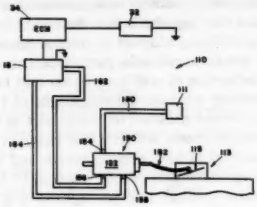
The portion of the term of this patent subsequent to Oct. 4, 2000, has been disclaimed.

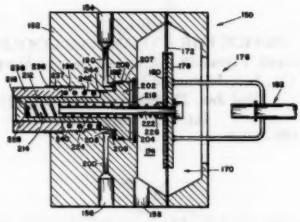
Int. Cl.⁴ B60K *31/00*; F02D *31/00*

U.S. Cl. 180—175 **18 Claims**

1. In a vehicle cruise control system of the type including a vacuum actuated servo connected to an engine throttle valve, a source of vacuum and a control means connecting the source of vacuum to the servo for controlling throttle position to maintain a preset vehicle speed, the improvement comprising adjustable modulator means operatively connected to said control means and said servo for automatically limiting opening movement of the throttle by modulating communication of vacuum through said control means to said servo to override said control means during normal operation of said control

means so that vehicle speed will drop below the preset vehicle speed which the control means seeks to maintain upon the





vehicle encountering an incline to increase fuel efficiency and soften throttle position changes.

4,561,518

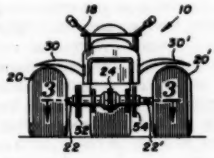
RECREATIONAL VEHICLE WITH LIMITED DIFFERENTIAL

James E. Grinde, Anoka, Minn., assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Continuation-in-part of Ser. No. 346,136, Feb. 5, 1982, abandoned. This application Dec. 9, 1983, Ser. No. 559,714

Int. Cl.⁴ B62K *5/04*

U.S. Cl. 180—215 **4 Claims**



1. In combination with an off-the-road motor vehicle of the type having a frame and at least one front steerable wheel and a pair of rear wheels rotatably mounted with respect to said frame:

(a) a torque transfer differential device including a housing at least a portion of which is rotatably journaled to said frame;

(b) first and second axles, at least one of which is journaled for rotation within said portion of said housing and supported with respect to said frame solely by said housing;

(c) motor means secured to said frame and drivingly coupled to said housing for rotating same;

(d) axially displaceable gear means individually splined to said first and second axles and having a plurality of equally spaced protrusions formed on a side surface of said axially displaceable gear means and disposed in said housing for automatically de-coupling the one of said first or second axles from said housing which has the higher rotational velocity at any given time; and

(e) braking means secured to said rotatable housing and adapted to be engaged by friction-applying means for coupling a braking force through said housing and said axially displaceable gear means to both said first and second axles when said first and second axles are moving at the same angular velocity and to the slower moving one of said first and second axles when said first and second axles are moving at different angular velocities.

4,561,519

REAR SUSPENSION FOR A MOTORCYCLE

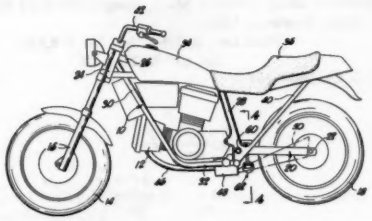
Yoshitaka Omori, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 5, 1983, Ser. No. 491,880

Claims priority, application Japan, May 11, 1982, 57-78692

Int. Cl.⁴ B62K *25/20*

U.S. Cl. 180—227 **8 Claims**



1. A rear suspension for a motorcycle having a frame, comprising

a rear wheel support frame pivotally mounted to the frame of the motorcycle such that the frame and said rear wheel support frame exhibit relative pivotal motion with operation of the suspension;

a rear cushion member positioned beneath said rear wheel support frame and extending transversely of the motorcycle; and

linkage means for inducing compression and extension of said cushion member with up and down pivotal motion of said rear wheel support frame relative to the frame of the motorcycle.

4,561,520

MAGNETICALLY SYNCHRONIZED CLUTCH APPARATUS

Mark J. Fogelberg, Muncie, Ind., assignor to Borg-Warner Corporation, Chicago, Ill.

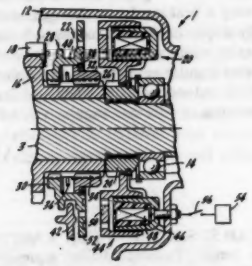
Filed Nov. 3, 1983, Ser. No. 548,589

Int. Cl.⁴ F16D *23/02*

U.S. Cl. 180—247 **20 Claims**

1. Magnetically synchronized clutch apparatus comprising a jaw clutch and an electromagnetic synchronizer, said jaw clutch including a rotatable sleeve member, and a rotatable shift assembly having a shift collar, a shift member, and means biasing said shift member for engagement with said sleeve member, said shift assembly being slidable to a disengaged position in which said members are disengaged, said shift assembly also being slidable to an engaged position in which said members remain disengaged when not rotating in approximate synchronism and in which said members are engaged by

said biasing means when rotating in approximate synchronism, said electromagnetic synchronizer being energizeable to bring



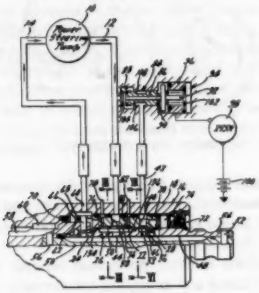
said members into approximate synchronism upon sliding of said shift assembly toward said engaged position.

4,561,521

VARIABLE ASSIST POWER STEERING SYSTEM

James J. Duffy, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 6, 1984, Ser. No. 678,844
Int. Cl.[4] B62D 5/08
U.S. Cl. 180—142 **17 Claims**



1. In a fluid pressure operated power steering gear mechanism having a fluid flow source, a pressure movable part adapted to be connected to a steering linkage for a vehicle, a drive member and a driving shaft connected to said drive member;

the connection between said drive member and said driving shaft comprising a torsion bar that accommodates angular displacement of said drive member relative to said driving shaft;

a rotary valve means situated in and partly defining pressure distribution and flow return passages extending to said pressure movable part and to said fluid flow source to effect pressure differential forces acting on said pressure movable part;

said valve means comprising an internal valve member and a surrounding sleeve;

said internal valve member having formed thereon two sets of valve lands, one set being axially displaced relative to the other, two sets of internal valve lands formed in said sleeve respectively registering with the valve land sets of said internal valve member;

said valve sleeve being connected operatively to said drive member for rotational movement therewith;

vehicle speed sensitive valve means for distributing fluid flow only to a first of said sets of valve lands at low vehicle speeds and for gradually increasing fluid flow to a second of said sets of said valve lands upon an increase in vehicle speed;

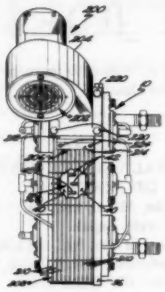
said internal valve member being connected to and rotatable with said driving shaft, the first set of said registering valve lands being adapted to control pressure distribution to said pressure movable part of said mechanism during initial deflection of said torsion bar and being adapted to progressively increase the magnitude of the pressure distributed to said pressure movable part as said torsion bar deflection increases within a first range of deflection during operation of low vehicle speeds and the other set of registering valve lands being adapted to control pressure distribution through said passages to said pressure movable part upon deflection of said torsion bar within a greater range of deflection of said torsion bar as fluid is distributed simultaneously to both valve lands sets at high vehicle speeds.

4,561,522

DEVICE FOR ENHANCING COOLING

Leonid Dayen, Plymouth, Minn., assignor to Horton Manufacturing Co., Inc., Minneapolis, Minn.

Filed Jan. 23, 1984, Ser. No. 573,121
Int. Cl.[4] F16D 65/84
U.S. Cl. 188—71.6 **7 Claims**



1. Rotational control apparatus comprising, in combination: an external housing having a circular periphery; a friction disc being longitudinally centrally arranged within the external housing, with the friction disc being formed of two single sided, similarly configured, component discs having radially extending fins projecting perpendicularly from one side of the component discs, with the component discs including air intake ports formed adjacent its center, with a cooling chamber being formed between the first and second component discs where air can enter the cooling chamber through the intake ports and pass between the component discs and along the heat radiating fins radially beyond the periphery of the friction disc, with a forward flow of air through the frictional disc being created by the rotation of the friction disc within the external housing, with the friction disc including a center and a periphery defining a plurality of radial segments arranged in a circular configuration, with a radial segment including substantially less than the circumference of the friction disc; a device for enhancing the cooling of the friction disc especially at relatively low friction disc RPM comprising, in combination: a wire guard housing secured to the cylindrical shaped periphery of the external housing, with the wire guard housing including a plurality of circular wires which are arranged in a parallel, spaced relation; at least a first squirrel cage type fan for drawing air from the atmosphere and directing it under pressure; and means for mounting the squirrel cage type fan to the wire guard housing such that the air from the squirrel cage type fan is directed radially inward into a single radial segment of the friction disc at a time in a direction counter to the for-

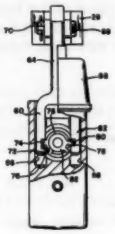
ward flow of air through the cooling cavity, said fan mounting means cooperating with said wires to allow circumferential adjustment of said mounting means, with the radial segment which the air from the fan is directed being at the ten o'clock or two o'clock position.

4,561,523

AUTOMATIC SLACK ADJUSTER

William E. Ott, Elyria, Ohio, assignor to Allied Corporation, Morristown, N.J.

Filed Dec. 16, 1983, Ser. No. 562,322
Int. Cl.⁴ F16D *51/22, 65/40*
U.S. Cl. 188—79.5 K **18 Claims**



1. Automatic slack adjuster for a vehicle brake actuated by a rotating drive shaft comprising a lever housing, means mounting said lever housing on said drive shaft to effect rotation of the latter in a brake application effecting direction upon stroking the lever housing, an adjustment shaft rotatably mounted in said lever housing and drivingly connected with the drive shaft to rotate the latter relative to the lever housing to effect brake adjustment by rotating the drive shaft relative to the housing in one direction when the adjustment shaft is rotated in a brake adjustment effecting direction and to back off said brake adjustment by rotating said drive shaft in the direction opposite to said one direction when the adjustment shaft is rotated in the direction opposite to said brake adjustment effecting direction, and means for effecting rotation of said adjustment shaft upon stroking of said lever housing, said rotation effecting means including back-off means for rotating said adjustment shaft in said opposite direction upon initial stroking of said housing and adjustment effecting means for rotating said adjustment shaft in the adjustment effecting direction after said initial stroking of said housing is effected.

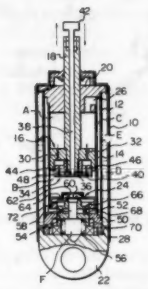
2. Automatic slack adjuster for a vehicle brake actuated by a rotating drive shaft comprising a lever housing, means mounting said lever housing on said drive shaft to effect rotation of the latter in a brake application effecting direction upon stroking the lever housing, an adjustment shaft rotatably mounted in said lever housing and drivingly connected with the drive shaft to rotate the latter relative to the lever housing to effect brake adjustment by rotating the drive shaft relative to the housing in one direction when the adjustment shaft is rotated in a brake adjustment effecting direction and to back off said brake adjustment by rotating said drive shaft in the direction opposite to said one direction when the adjustment shaft is rotated in the direction opposite to said brake adjustment effecting direction, and means for effecting rotation of said adjustment shaft upon stroking of said lever housing, said rotation effecting means including back-off means for rotating said adjustment shaft in said opposite direction upon initial stroking of said housing and adjustment effecting means for rotating said adjustment shaft in the adjustment effecting direction, said rotation effecting means including a link pivotally connected to said lever housing, and means pivotally connecting the back-off means and the adjusting effecting means to said link.

4,561,524

DAMPING FORCE REGULATION DEVICE FOR TELESCOPE SHOCK ABSORBER

Ken Mizumukai, Iwakura; Tatuya Masamura, and Hiroshi Yamanaka, both of Kani, all of Japan, assignors to Kayaba Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 26, 1983, Ser. No. 461,082
Claims priority, application Japan, Feb. 1, 1982, 57-12645[U]
Int. Cl.⁴ F16F *9/348*
U.S. Cl. 188—319 **11 Claims**



1. A damping force regulation device for a telescopic shock absorber, comprising:

a tubular shell;

an inner tube and an outer tube coaxially received in said shell;

a piston slidably received in said inner tube and comprising first and second damping valves arranged in parallel therein, said first damping valve opening upon expansion of the shock absorber while said second damping valve opening upon contraction of the shock absorber;

damping force adjusting means arranged in series with the first and second damping valves for adjusting a damping force;

an upper fluid chamber and a lower fluid chamber individually defined by the piston and the inner tube at opposite sides of the piston;

a reservoir chamber defined by the outer tube and the tubular shell;

a first passageway for communicating said reservoir chamber and the upper fluid chamber to each other;

a second passageway for providing communication between the reservoir chamber and the lower chamber; and

a base valve positioned in a lower portion of the inner tube;

said base valve comprising a check valve disposed in the second passageway which communicates the lower fluid chamber to the reservoir chamber, first spring means biasing the check valve to a closed position, said check valve overcoming the bias of the first spring means and opening in response to an expansion stroke of the piston, a valve spool with an annular dashpot chamber disposed in the first passageway, second spring means biasing the valve spool in a direction to close off communication between the upper fluid chamber and the reservoir chamber, the valve spool overcoming the bias of the second spring means to communicate the upper fluid chamber to the reservoir chamber in response to a pressure elevation in the lower fluid chamber when the piston moves in a contraction stroke.

4,561,525

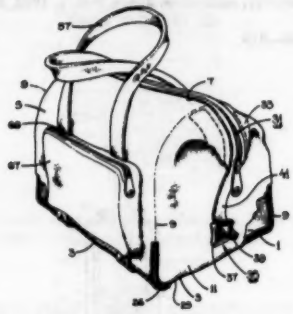
UTILITY BAG WITH SUSTAINED OPEN CONFIGURATION

Morris C. Shidner, 1374 Ramona St., Ramona, Calif. 92065

Filed Nov. 7, 1983, Ser. No. 549,307

Int. Cl.⁴ A45C *5/00*

U.S. Cl. 190—106 **14 Claims**



1. A collapsable and machine washable utility bag comprising:

(a) a flat yet flexible base defining an enclosed outer edge;

(b) a pair of opposed flexible yet retentive side panels, extending upward for vertical positioning from opposed portions of said base outer edge, having respective top and side edges;

(c) a pair of opposed supple end panels, extending upward from opposed free portions of said base outer edge, having respective top and side edges and joined to said side panels along their mutually adjacent side edges and being arranged to be straightened vertically upward along with said side panels to form an open-bag configuration;

(d) a flexible yet retentive divider panel interposed and shorter than said side panels having opposed side edges attached to said end panels and arranged to form a two-compartment bag;

(e) flexible means for closing said bag by joining said side panel top edges together and closing each said end panel top edge over onto itself to form exterior end flaps that may be folded down and attached lower onto said end panels to form a compact bag configuration; and,

(f) a flat strip of flexile material of heavier gauge than said end panel attached to said end panels near the top edges thereof and extending therealong to sustain said open-bag configuration when said bag is opened, said panels vertically arranged and said strips straightened.

4,561,526

STEERING AND SUPPORT HANDLE FOR WHEELED LUGGAGE

Roger D. Winter, and James K. Jennings, Jr., both of Lakewood, Colo., assignors to Samsonite Corporation, Denver, Colo.

Filed Jan. 3, 1983, Ser. No. 453,813

Int. Cl.⁴ A45C *5/14, 13/26*

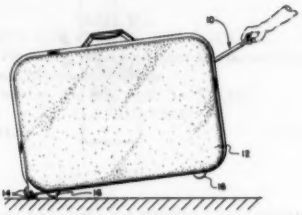
U.S. Cl. 190—115 **23 Claims**

4. An improved steering and support device for a luggage case having wheels at a lower bottom corner adjacent a rear side thereof upon which to roll the case and its contents when the case is supported from the wheels, comprising in combination:

a handle having a pivoted end and a gripping end adapted to be grasped for levering and supporting the weight of the case and its contents on the rear wheels and for steering the case as it is rolled on its rear wheels, said handle being generally T-shaped having a longitudinal portion extending from the pivoted end to the gripping end, and the gripping end being defined substantially by a cross piece extending transversely from the end of the longitudinal piece opposite the pivoted end;

a hinge block connected to the case on a front side near an upper corner, the hinge block operatively connecting the handle to the case substantially only at the pivoted end, said hinge block operatively retaining the handle for pivoting movement between an inoperative position wherein the handle extends generally downward toward the bottom of the case adjacent a front side of the case and an operative position wherein the handle extends forward and slightly upward from the hinge block;

the pivoted end of the handle comprising a pair of transversely spaced apart extensions extending longitudinally forward on opposite transverse sides of the pivoted end of the longitudinal piece of the handle, a pivot shaft extending transversely across the space between the extensions, and a shaft lever extending from the pivot shaft;



the hinge block comprising a base portion and a neck portion of reduced transverse width extending from the base portion, the base and neck portions defining an interior opening within the hinge block, the neck portion having a pivot opening extending transversely therethrough to receive the pivot shaft of the handle, the shaft lever fitting within the interior of the opening in the hinge block when the pivot shaft is received in the pivot opening;

a spring retained within the interior opening of the hinge block and operative between the shaft lever and the hinge block to develop a torsional force on the handle in a rotational direction for maintaining the handle in the inoperative position when the handle is manually moved to the inoperative position and operative to develop a torsional force in the opposite rotational direction for maintaining the handle in the operative position when the handle is manually moved to the operative position.

4,561,527

ELECTRIC PARKING BRAKE SYSTEM FOR A VEHICLE

Hiromasa Nakamoto; Yukinobu Natsuaki; Osamu Michihira, and Futoshi Shoji, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Jan. 31, 1984, Ser. No. 575,742

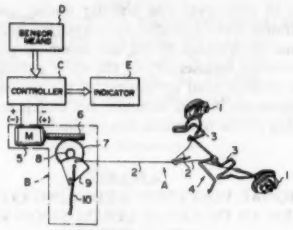
Claims priority, application Japan, Jan. 31, 1983, 58-15008; Jan. 31, 1983, 58-15010; Jan. 31, 1983, 58-15009; Feb. 4, 1983, 58-17936; Feb. 4, 1983, 58-17937

Int. Cl.⁴ B60K *41/20*

U.S. Cl. 192—4 C **8 Claims**

1. An electric parking brake system for a vehicle comprising: a parking brake; an electromagnetic means operable to apply and release said parking brake; a command signal producing means adapted to put out a brake application command signal or a brake release command signal to said electromagnetic means; a switch means adapted to be manually operated to switch the operation of said command signal producing means between a manual brake application and brake release control mode and an automatic control mode; a power supply circuit having a battery and an ignition power source for supplying power to said electromagnetic means, said power supply circuit being operatively connected with said switch means in a manner such that power is supplied to said electromagnetic

means from said battery when said switch means is manually operated to switch said command signal producing means into the manual brake application control mode, and from said



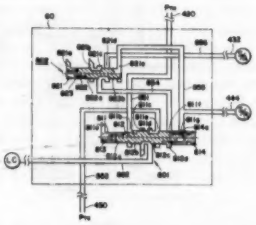
ignition power source when said switch means is manually operated to switch said command signal producing means into the manual brake release control mode.

4,561,528

LOCK-UP CLUTCH CONTROL VALVE ASSEMBLY

Kazuhiko Sugano, Zama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 16, 1983, Ser. No. 494,647
Claims priority, application Japan, May 20, 1982, 57-83925
Int. Cl.⁴ F16D *25/00, 33/00*
U.S. Cl. 192—0.052 **6 Claims**



1. A control for a lock-up clutch for an engine driven automatic transmission having a plurality of forward speed ratios including a lowest speed ratio and a highest speed ratio, comprising:

first fluid pressure providing means for providing a first fluid pressure when each of the plurality of speed ratios except the lowest speed ratio is established in the transmission;

second fluid pressure providing means for providing a second fluid pressure when a predetermined speed ratio between the highest and lowest speed ratios is established in the transmission;

a lock-up control valve operatively connected with the lock-up clutch and being movable to first and second positions for controlling the disengagement and engagement respectively of the lock-up clutch, said lock-up valve including a first pressure acting area adapted to communicate with said first fluid pressure providing means, and a second pressure acting area in fluid communication with said second fluid pressure providing means to be biased toward said second position thereof;

a lock-up timing valve operatively connected between said first fluid pressure providing means and said lock-up valve and being movable to a first position for communicating said first fluid pressure to said first pressure acting area to bias said lock-up valve means toward said second position thereof and to a second position to exhaust the bias pressure acting on said first pressure acting area, said lock-up timing valve means including a pressure acting area in fluid communication with said second fluid pressure providing means and being biased by said second fluid pressure toward said second position thereof;

first resistive means for resisting a movement of said lock-up timing toward said second position thereof until said second fluid pressure increases above a first predetermined value; and

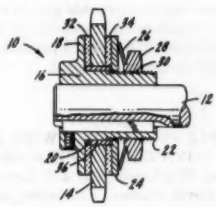
second resistive means for resisting a movement of said lock-up valve toward said second position thereof until said second fluid pressure increases above a second predetermined value, said second predetermined value being higher than said first predetermined value.

4,561,529

TORQUE-LIMITING CLUTCH WITH TEMPERATURE-RESPONSIVE RAPID RELEASE MECHANISM

Arthur M. McIntosh, Arlington Heights, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Sep. 2, 1983, Ser. No. 528,920
Int. Cl.⁴ F16D *43/25*
U.S. Cl. 192—56 R **6 Claims**



1. A torque-limiting clutch comprising an input member, an output member, a hub secured to one of said members, at least one friction element movable relative to at least one of said members to an engaged position for frictionally engaging said clutch and to a disengaged position in which said clutch is disengaged, means developing a clutch-engaging force tending to move said friction element relatively to its engaged position and thereby effect clutch engagement at a predetermined torque load setting, and rapid release means responsive to the sensing of a temperature increase to a predetermined level for developing a clutch-disengaging force tending to move said friction element relatively to its disengaged position and thereby effect clutch disengagement, said rapid release means including a thermal spring formed from an SME material, said thermal spring including a bushing supporting the other of said members on said hub.

4,561,530

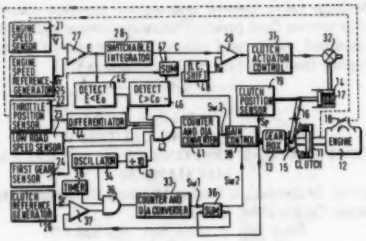
ELECTRONIC CLUTCH CONTROL SYSTEM

David Parsons, Kenilworth; Harry M. Windsor, and John V. Comfort, both of Leamington Spa, all of England, assignors to Automotive Products plc, Leamington Spa, England

Filed Aug. 9, 1983, Ser. No. 521,600
Claims priority, application United Kingdom, Aug. 11, 1982, 8223144
Int. Cl.⁴ B60K *41/28*; F16D *13/75*
U.S. Cl. 192—0.076 **8 Claims**

1. An electronic control system for a friction clutch in an engine driven vehicle for starting the vehicle from rest comprising an engine speed sensor operatively connected to said engine for deriving an engine speed signal, means for deriving a clutch actuation command signal from the engine speed signal, a clutch position sensor operatively connected to said clutch for deriving a clutch position signal, means for comparing the command signal with the clutch position signal and deriving therefrom a comparison signal, a clutch actuation system responsive to said comparison signal and operatively

connected to said clutch to move the clutch towards an engaged state when said command signal indicates that the engine speed rises, and thereby load the engine to hold down the engine speed, means for deriving and storing a clutch condition compensation signal from values of said engine speed signal and command signal during one clutch engagement and a gain



control disposed operatively between said clutch position sensor and said means for comparing the command signal with the clutch position signal to provide gain in the clutch position signal, the gain control being responsive to the compensation signal to adjust the gain of the clutch position signal prior to its comparison with the command signal.

4,561,531

HYDRAULIC SLAVE CYLINDER WITH LATCH MEANS FOR USE WITH CLUTCH RELEASE BEARING

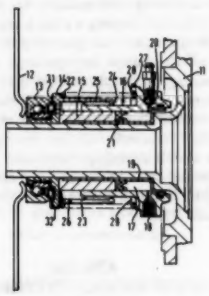
Alastair J. Young, Kenilworth; David R. Arrowsmith, Leamington Spa, and David Parsons, Kenilworth, all of England, assignors to Automotive Products plc, Leamington Spa, England

Filed Dec. 13, 1982, Ser. No. 449,515

Claims priority, application United Kingdom, Dec. 15, 1981, 8137793

Int. Cl.⁴ F16D *25/08, 13/44*

U.S. Cl. 192—85 CA **5 Claims**



1. A hydraulic slave cylinder for use with a clutch release bearing, the slave cylinder comprising:

a cylinder component;

an annular piston component concentric with the cylinder components and axially slidable relative thereto;

an annular chamber having walls defined by the cylinder component and the piston component;

an inlet port in one of said components for connecting the annular chamber to a source of hydraulic pressure, said pressure acting to move the piston and cylinder components in a direction for clutch release;

first and second spring abutment members carried by said piston and cylinder components respectively;

spring means acting between said abutment members for biassing the abutment members apart in the same direction as movement induced by hydraulic pressure in the annular chamber;

and latch means integral with said abutment members which limits relative axial movement of the abutment in the assembled slave cylinder but allows the abutment members to slide over one another during assembly of the hydraulic slave cylinder, by temporary deflection of part of said latch means during said assembly, said latch means preventing disassembly of the slave cylinder by limiting said relative axial movement of the piston and cylinder components in said direction for clutch release after assembly of the hydraulic slave cylinder.

4,561,532

TORSIONAL VIBRATION REDUCING CONNECTION BETWEEN AN INTERNAL COMBUSTION ENGINE AND A TRANSMISSION

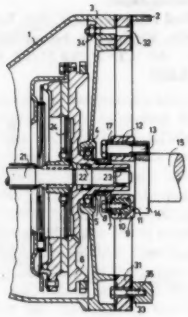
Gunter Knödel, Mühlacker, Fed. Rep. of Germany, assignor to Getrag Getriebe- und Zahnradfabrik GmbH, Ludwigsburg, Fed. Rep. of Germany

Filed Sep. 28, 1982, Ser. No. 425,940

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1982, 3206837

Int. Cl.⁴ F16D *3/12, 3/50, 3/84*

U.S. Cl. 192—106.1 **11 Claims**



1. A connecting construction for use between an internal combustion engine and a transmission of a vehicle,

said construction comprising an engine housing,

an engine crankshaft rotatably mounted in said engine housing,

a transmission housing,

a transmission drive shaft rotatably mounted in said transmission housing,

an additional crankshaft section,

a flywheel mounted on said additional crankshaft section and solidly secured thereto for rotation therewith,

said transmission housing having bearing supporting means thereon,

a bearing connected between said bearing supporting means and said additional crankshaft section and rotatably supporting said additional crankshaft section,

said additional crankshaft section having an end portion extending toward said crankshaft,

torsionally elastic coupling means connected between said crankshaft and said end portion of said additional crankshaft section for elastically transmitting driving torque between said crankshaft and said additional crankshaft section,

said additional crankshaft section transmitting said driving torque to said flywheel,

said torsionally elastic coupling means reducing torsional vibrations transmitted to said flywheel,

a torque transmitting device for transmitting torque between said flywheel and said transmission drive shaft,

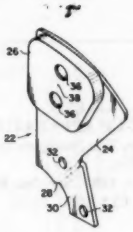
and torsionally elastic connecting means connected between said engine housing and said transmission housing for reducing torsional vibrations transmitted therebetween.

4,561,533

CHATTER FREE ROTARY FRICTION DEVICE AND METHOD OF MAKING THE SAME

Frank N. Roseto, 2 Knoll La., Jericho, N.Y. 11753

Filed Sep. 6, 1983, Ser. No. 529,588
Int. Cl.⁴ F16D *13/60, 11/00*
U.S. Cl. 192—107 M **10 Claims**



1. A rotary friction device having a plurality of relatively rotating members each with an axis of rotation passing therethrough,

a plurality of plates each connected to one of said members in a plane substantially perpendicular to said axis of rotation and being circumferentially spaced thereabout,

friction means mounted on each said plate for frictional engagement with at least another of said members to restrain relative rotation between said members,

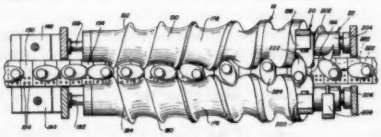
and a plurality of means connecting each said plate to said one member each at a point arcuately rearward of the mount of said friction means to said respective plate such that when said friction means is engaged with another relatively rotating member moving in a rotational direction about said axis of rotation said plate is placed in tension between said friction means and said connecting means and to avoid production of chattering.

4,561,534

CONTAINER ORIENTING APPARATUS

John C. Nalbach, Western Springs, Ill., assignor to John R. Nalbach Engineering Co., Inc., Chicago, Ill.

Filed Oct. 5, 1984, Ser. No. 658,354
Int. Cl.⁴ B65G *47/24*
U.S. Cl. 198—400 **23 Claims**



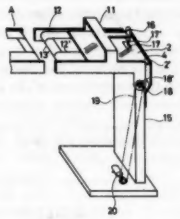
1. An apparatus for orienting substantially identical containers, each container having a base for holding the container substantially upright, each container having a portion of its outer surface asymmetrical in a plane substantially perpendicular to the base, the apparatus comprising; a longitudinal conveyor movably carrying said containers from one end of the conveyor to the other end of the conveyor, a first turning assembly adjacent to a portion of the longitudinal conveyor rotating each of the containers on the conveyor to a position in which each container has its asymmetrical plane substantially parallel to the direction of movement of the conveyor, an attitude detector sensing the position of the asymmetrical plane of each container after completion of rotation by the first turning assembly, and a second turning assembly having a portion controlled by the attitude detector for turning approximately 90° selectively either clockwise or counterclockwise each container to align all of the containers wherein the plane of asymmetry of each container is substantially parallel to the plane of asymmetry of each of the turned containers and the plane of asymmetry of each container is in the same attitude as the plane of asymmetry of each other container discharged from the second turning assembly.

4,561,535

APPARATUS FOR PLACING A BOARD INTO AN UPRIGHT STATE

Matsuyoshi Taniguchi, Shiga, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Feb. 17, 1984, Ser. No. 581,072
Claims priority, application Japan, Jun. 4, 1983, 58-99847
Int. Cl.⁴ B65G *47/24*
U.S. Cl. 198—406 **5 Claims**



1. Apparatus for moving a board from a horizontal to an upright position, comprising:

(a) conveyor means for conveying the board in a generally horizontal direction;

(b) positioning means for contacting and positioning the leading edge of the board at a predetermined position as said board travels along the conveyor means;

(c) holding means for holding the board on the conveyor means at the predetermined position;

(d) means for moving the board held on the conveyor means into an upright position, wherein the leading edge of the board is directed upward; and

(e) clamping means for clamping the leading edge of the board in the upright position, said clamping means being provided substantially above said leading edge of the board and movable in vertical directions, whereby when the board is transferred upright from the conveyor means to the clamping means, the leading edge of the board is clamped at the same elevational position independent of size or length of the board.

4,561,536

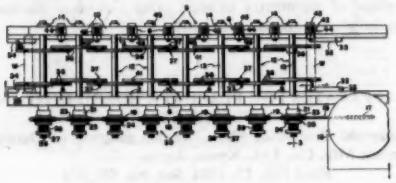
ROTARY CONVEYOR APPARATUS

Richard A. Weaver, Linden; James H. Niedzielski, Fenton, and Ronald M. Prime, Flint, all of Mich., assignors to Prime & Weaver Investment Company, Fenton, Mich.

Filed Aug. 5, 1983, Ser. No. 520,731
Int. Cl.⁴ B65G *29/00*
U.S. Cl. 198—481.1 **11 Claims**

1. Conveyor apparatus comprising a plurality of rotors; means mounting said rotors for rotation about spaced apart axes, each of said rotors including a set of discs each of which has at least one recess in its periphery, the spacing between the discs of each set being such as to enable a workpiece to be accommodated and supported in the recesses of said set of

discs, the discs of adjacent sets and the spacing between the axes of adjacent rotors being such that the peripheries of the discs of adjacent rotors overlap one another; continuously operable drive means; and clutch means coupling said drive means to the respective rotors for selectively enabling and disabling rotation of said rotors in one direction only and such that a workpiece supported in the recesses of one set of discs is moved downstream through an arc toward the next adjacent set of discs for engagement with the peripheries of the discs of said next adjacent set or for accommodation in the recesses



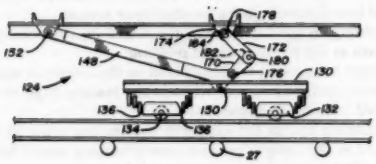
thereof, depending upon the relative rotary positions of said one set of discs and said next adjacent set of discs, each of said recesses being of such radial depth and having a trailing surface of such radial abruptness that engagement of a workpiece supported in the recesses of the discs of any upstream one of said rotors with the peripheries of the discs of the next adjacent downstream rotor will disable rotation of said one upstream rotor until the next adjacent downstream rotor has rotated to a position in which the recesses in its discs may accommodate said workpiece.

4,561,537

PRESSURE DEVICE FOR CONVEYOR

Joseph A. Dos Santos, Winfield, Ala., assignor to Continental Conveyor & Equipment Co., Inc., Winfield, Ala.

Filed Aug. 17, 1983, Ser. No. 524,056
Int. Cl.[4] B65G 15/14
U.S. Cl. 198—628 **2 Claims**



1. For use in a high angle conveying apparatus having a conveyor belt and a cover belt supported on framing members trained for movement in endless configurations through a lifting zone whereat said belts are moved into operative association with each other so that material on said conveyor belt will be held in contact therewith by said cover belt, improved pressure means for applying essentially fully equalized pressure to the back surface of said cover belt including:

(a) a module of rollers,

(b) at least one row of rollers mounted within said module, each row of rollers positioned to contact the back surface of the cover belt along a line transverse to the direction of movement of the cover belt, each said row of rollers comprising a plurality of freely rotatable individual rollers contacting the cover belt across the major extent of the line across the cover belt, with each roller being on an individually moveable axis of rotation to permit conformance of each roller to the cover belt independent of its adjacent roller,

(c) support means pivotally coupled at a first end to one of said framing members and at a second end to said module of rollers for movement of the module as a whole relative to said framing members.

(d) link means coupled at a first end to one of said framing members of the conveying apparatus at a position adjacent said module of rollers and coupled at a second end to said support means, and a pivotable joint between said first and second ends; and

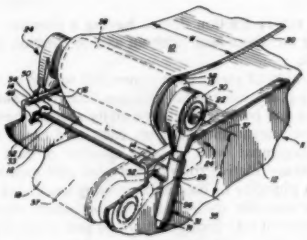
(e) a torsion spring means coupling said joint to spring bias said link means to urge each said row of rollers into contact with the back surface of the cover belt for applying essentially fully equalized pressure thereto.

4,561,538

TAKE-UP APPARATUS

Rudy P. Zwiebel, Cudahy, Wis., assignor to Magnetics International, Inc., Cudahy, Wis.

Filed Dec. 9, 1983, Ser. No. 559,643
Int. Cl.[4] B65G 23/44
U.S. Cl. 198—816 **10 Claims**



1. In a conveyor system of the type having a housing including laterally spaced, upright walls defining a space therebetween, an endless conveyor belt, a first pulley connected with the housing and having a rotational axis and a portion surroundingly engaged by the belt and a second pulley spaced from the first pulley and having a second shaft with a second rotational axis and a portion surroundingly engaged by the endless belt, an improved take-up assembly comprising:

a body member having first and second end portions;

means carried by the first end portion for rotatably receiving the shaft on the second pulley;

the second end portion having first and second cylindrical members telescopingly engaged, one within the other, said second cylindrical member being connected to said first end portion;

means pivotally engaging the first cylindrical member at a position between the axial ends of the first cylindrical member to one of the walls for rotation about a third pivot axis substantially parallel to the rotational axes of the pulleys;

whereby a portion of the first cylindrical member extends unsupported from the third pivot axis away from the first end portion; and

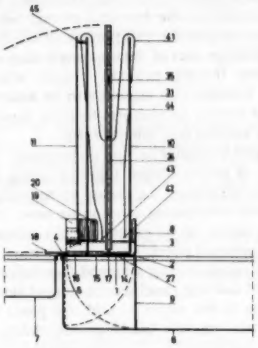
means for varying the relative positions of the first and second cylindrical members so that the distance between the third pivot axis and the second rotational axis is adjustable to control the tension on the belt,

said body member being rotated in a first direction about the third pivot axis for tensioning said conveyor belt and in a second direction causing the belt to relax, thereby permitting repositioning of the belt to gain access to the space between the upright walls for cleaning and/or repair of the conveyor system.

4,561,539
CLAMPING DEVICE FOR LONG TROUSERS, PARTICULARLY IN SUITCASES

Peter Anders, Ahornallee 47, D-1000 Berlin 19, Fed. Rep. of Germany

PCT No. PCT/DE84/00037, § 371 Date Oct. 18, 1984, § 102(e) Date Oct. 18, 1984, PCT Pub. No. WO84/03207, PCT Pub. Date Aug. 30, 1984
PCT Filed Feb. 16, 1984, Ser. No. 673,702
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1983, 3307399
Int. Cl.[4] A24F *15/00*; B65D *85/18*
U.S. Cl. 206—279 12 Claims



1. Clamping device for long trousers, particularly in suitcases, characterized by:

(a) a base plate (1) with an elbow (3) pointing upward at right angles on a longitudinal edge (2), a buffer (8) being provided on the inside of the elbow (3),

(b) hangers (10 and 11) of different widths disposed on the base plate (1) spaced apart and parallel to the longitudinal edges (2) of the base plate (1), and movable in relation to the elbow (3),

(c) a pressure block (19) provided with a flexible buffer (20) opposite the buffer (8) on the elbow (3) of the base plate (1) and adjustable in relation to the elbow (3) so that the trouser legs (43) reaching down to the lower edge of the buffer (20) as well as the waistband (42) of the trousers (41) placed loosely over the two hangers (10 and 11) are clamped fast between the two buffers (8 and 20) when the hanger (10) disposed closest to the elbow (3) of the base plate (1) as well as the pressure block (19) are brought up to the elbow (3),

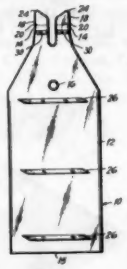
(d) a guide frame (24), hinged to the base plate (1) between the hangers (10 and 11), whose width and height are greater than those of the hangers (10 and 11) and which may be swung from a position in the plane of the base plate (1) into a position vertical thereto and parallel to the hangers (10 and 11), and comprising a releasable adjustable tension bracket (35) which clamps the trouser length (44) hanging loosely between the hangers (10 and 11) when shifted toward the base plate (1).

4,561,540
MICROSCOPE DRAPE

James D. Hunter, and James J. Smith, both of Jacksonville, Fla., assignors to Xomed Inc., Jacksonville, Fla.

Filed Dec. 14, 1983, Ser. No. 561,384
Int. Cl.[4] B65D *85/38*; G02B *0/00*
U.S. Cl. 206—305 7 Claims

1. A disposable microscope drape for positioning over an operating microscope in enclosing relationship thereto comprising an elongate, continuous, substantially tubular drape open at one end and terminating at the other end in at least one elongate, outwardly projecting cylinder-defining ocular housing for receiving an ocular of the microscope, said ocular housing having attached thereto an elongate strip of malleable metal having a length substantially less than that required to

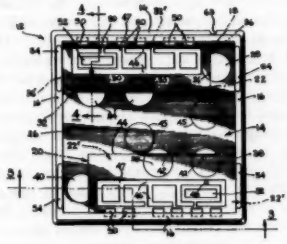


encircle said ocular housing whereby loose material may be gathered tightly and secured around the ocular of said microscope by manually folding and creasing the metal strip upon itself.

4,561,541
CARRIER SYSTEM FOR PHOTOVOLTAIC CELLS

Ivan R. Lawrence, Simi Valley, Calif., assignor to Spectrolab, Incorporated, Sylmar, Calif.

Filed Sep. 26, 1983, Ser. No. 536,057
Int. Cl.[4] B65D *21/02*, *85/30*, *73/02*
U.S. Cl. 206—332 20 Claims



1. A tray for retaining a flat photovoltaic cell in a predefined cell position, said tray comprising:

(a) a base having an upper surface thereon against which the flat cell can lie;

(b) at least three upstanding indexing elements integrally formed with said base upper surface at said cell position, said indexing elements being integrally formed with said base upper surface at said pre-defined cell position to thereby define the pre-defined cell position for the flat photovoltaic cells,

(c) walls defining a recess in said upper surface of said base, said recess lying between said indexing elements so that when a cell lies on said upper surface the cell covers said recess, a vacuum connection to said recess so that when vacuum is drawn on said recess a cell lying thereover is retained against said upper surface; and

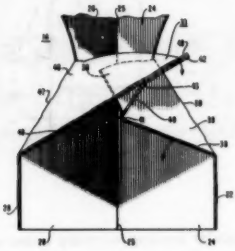
(d) walls defining at least one probe opening through said base, said probe opening being positioned between said indexing elements and away from said vacuum recess so that a photovoltaic cell can be vacuum restrained against said bottom surface and probed both top and bottom.

4,561,542

ELECTRIC LAMP PACKAGE AND CARTON THEREFOR

Edward Przepiora, Pierrefonds, Canada, and Gerald T. Lombardi, Florida, N.Y., assignors to North American Philips Corporation, New York, N.Y.

Continuation of Ser. No. 442,072, Nov. 16, 1982, abandoned.
This application Nov. 21, 1984, Ser. No. 674,360
Int. Cl.⁴ B65D *5/10*
U.S. Cl. 206—618 **11 Claims**



1. A carton for packaging and displaying a bulbous-shaped electric lamp or similar fragile article comprising:

a paperboard sleeve that is open at both ends and has six walls that are hingedly connected to one another, said walls being of such size and shape that the sleeve can be collapsed and then erected into hexagonal tubular form, and

automatically actuated locking means automatically actuated when the sleeve is erected for locking the sleeve in such erected tubular form and for holding an electric lamp or similar article in inserted position within the carton, said automatically actuated locking means comprising a foldable flap assembly having a plurality of panels that constitute parts of opposing walls of the sleeve secured to one another and are so shaped and articulated that the flap assembly is automatically actuated when the sleeve is erected and forms a platform that extends across the sleeve proximate one end thereof locking the sleeve in its fully erected configuration and has an aperture adapted to receive and frictionally grip an end portion of the inserted electric lamp or similar article, and the various panels of the flap assembly when displaced from the associated walls of the erected sleeve into locking position across the sleeve leaving openings in the sides of the carton that serve as product-display windows, wherein the six walls which form the collapsible open-ended sleeve are of substantially the same size and are arranged that three walls overlie and are substantially aligned with the other three walls when the sleeve is in collapsed condition, and the panels which form said flap assembly comprise medial parts of the associated oppositely-disposed walls, said flap assembly comprising a first group of panels that constitute connected medial parts of oppositely-disposed walls of the sleeve and are foldable along hinge lines that extend transversely of the hinge lines that connect the respective walls to one another, and a second group of panels that also constitute medial parts of said oppositely-disposed walls of the sleeve but are foldable along hinge lines that are angularly oriented relative to the hinge lines that connect the respective walls to one another, said second group of panels constituting two pairs of gussets that are connected to the first group of panels and fold inwardly toward one another when the sleeve is being erected, and wherein the hinge lines that join the six walls of the sleeve to one another are substantially straight and substantially parallel to one another, and the first group of panels comprising (a) a first main panel that constitutes a medial part of one of the sleeve walls and is foldable along the two parallel-spaced hinge lines that join said one wall to the adjacent walls of the sleeve and along a third hinge line that is substantially normal to and extends between the said two parallel-spaced hinge lines, and (b) three panels that together constitute a medial part of the oppositely-disposed wall of the sleeve and are foldable along three hinge lines that are substantially parallel to one another and substantially normal to the parallel-spaced hinge lines that join said oppositely-disposed wall to the adjacent sleeve walls, only one of the said three panels being connected to the adjacent sleeve walls by the parallel-spaced hinge lines which join said oppositely-disposed wall to said adjacent sleeve walls and constituting a second main panel, the remaining two panels being freely movable and constituting a dual-segment tabuluar extension, and the panel which comprises the free end of said tabular extension being fastened to the end portion of the first main panel that constitutes part of the oppositely-disposed wall of the sleeve and thereby provides a joint which causes the integral foldable flap assembly to be automatically actuated and locked in platform-forming position when the sleeve is erected into tubular form.

8. A collapsible tubular carton, comprising:

a plurality of panels hinged together along adjacent panel edges for permitting the carton to be collapsed flat with each panel confronting an opposite panel and for permitting the carton to be expanded to a tubular shape with pairs of opposed panels spaced away from each other;

one of said panels having a hinged flap defined by a medial portion of said one panel section hinged along a hinge line transverse to the edges of said one panel and pivotable toward the opposite panel corresponding to said one panel;

said corresponding panel opposite said one panel having a hinged flap defined by a medial portion of said corresponding panel hinged along three hinge lines transverse to the edges of said corresponding panel to define three hinged flap portions, a first flap portion furthest from said corresponding panel, a second flap portion and a third flap portion adjacent said corresponding panel; and

means for fastening said first flap portion to said flap of said one panel at a position along said flap of said one panel such that the tubular carton will lie flat in a collapsed condition with said first, second and third flap portions flat against said flap of said one panel;

said second and third flap portions together having a total length such that said second and third flap portions lie substantially coplanar extending from the hinge line between said first and second flap portions back to said corresponding panel when the carton is expanded to a tubular shape and said flap of said one panel is folded inwardly of the carton to lie transverse to the carton; and

said second and third flap portions having relative lengths such that as the carton is expanded from its collapsed condition to its tubular condition said flap of said one panel and said second and third flap portions of said corresponding panel pull away from each other with said second and third flap portions pivoting relative to each other, said third flap portion pulling said second flap portion away from said flap of said one panel until said second flap portion folds back toward said first flap portion so as to lie against said first flap portion and coplanar with said third flap portion when the carton is fully expanded.

4,561,543

PROTECTIVE ENCLOSURE FOR LIQUID-CONTAINING POUCHES

Kevin R. Thompson, Columbus, Ohio, assignor to Abbott Laboratories, North Chicago, Ill.

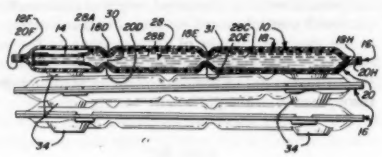
Filed Dec. 5, 1984, Ser. No. 678,307
Int. Cl.⁴ B65D *81/02*
U.S. Cl. 206—523 **12 Claims**

1. For use with a primary package of flexible material defin-

ing an interior volume containing a liquid; a secondary package comprising:

enclosure means adapted to define an interior space and to enclose said primary package therein;

and dividing means projecting inwardly into said interior space of said secondary package and adapted to constrict said flexible primary package along at least one line which divides said liquid-containing volume of said primary



package into at least two liquid volume segments in a manner to oppose flow of the liquid from a second one of said liquid volume segments into a first one of said liquid volume segments when the pressure in said second liquid volume segment exceeds that in said first liquid volume segment;

whereby, in the event of an impact against said second liquid volume segment, said first liquid volume segment is at least partially protected from the resulting shock.

4,561,544

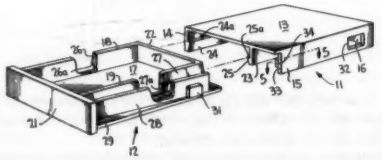
CHILD RESISTANT CONTAINER

Randy F. Reeve, Washington Court House, Ohio, assignor to Calmar, Inc., City of Industry, Calif.

Filed Dec. 28, 1983, Ser. No. 566,226

Int. Cl.⁴ B65D *6/06, 85/56*

U.S. Cl. 206—540 **4 Claims**



1. A child resistant container for pills and the like, comprising a lid of one-piece construction having an open front, a top wall and connecting side walls integrally joined thereto, a wall integrally joined to and depending from said top wall lying parallel to and spaced inwardly of one of said side walls, a tray of one-piece construction having a bottom wall and connecting side walls and end walls integrally joined thereto forming a receptacle, said side walls of said tray being in sliding engagement with said depending wall and the other of said side walls of said lid, means on said depending wall and said other wall in engagement with said tray for slideably supporting and guiding said tray within said lid between closed and open positions of said tray, one of said end walls defining a closure for said open front of said lid, a spring arm integrally connected only at one end to said closure and extending toward the other of said end walls, said arm being spaced inwardly of an adjacent end edge of said closure, lying between said one side wall and said depending wall of said lid and being spring biased for movement toward and away from said one side wall, an outwardly extending lock button on said arm adjacent the free end thereof and spaced a predetermined distance from said closure, and said one side wall of said lid having an aperture therein spaced from said closure equal to said predetermined distance in said closed position for the reception of said button under the spring bias of said arm for locking said lid and said tray together in the closed position, said button being manually depressible for movement out of said aperture against the spring bias of said arm into a release position to facilitate the opening of said tray while continuing to manually depress said button.

4,561,545

SORTING CONVEYOR

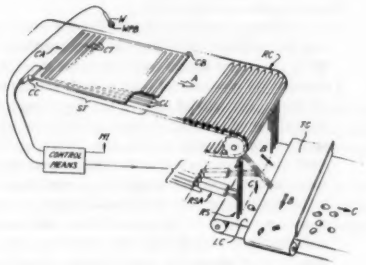
Charles A. Carlow, Edinburgh, Scotland, assignor to National Research Development Corp., London, England

Filed Apr. 25, 1983, Ser. No. 488,604

Claims priority, application United Kingdom, Apr. 23, 1982, 8211777

Int. Cl.⁴ B07C *5/36*

U.S. Cl. 209—564 **19 Claims**



1. Sorting apparatus including a support surface to receive objects to be sorted, means to move received objects to a point of selective discharge from the support surface, means to produce said selective discharge, an indicator movable to objects supported on the surface to indicate the position of an object to be sorted in a particular way by said selective discharge, means to co-operate with the indicator to record the position of the indicator and the proximity of the indicator to said recorded position, means to generate a signal to identify the position to be recorded, means responsive to the recorded position and to the action of the means to move the objects to operate said selective discharge means to appropriately sort the object on discharge from the surface, and including means responsive to the record of the proximity of the indicator to said position to generate a signal representing the size of the object whose position is indicated, said means to produce selective discharge being responsive to said object size signal to adjust the suit the size of an object to be discharged.

4,561,546

SEEDLING GRADING MACHINE

William H. Maroney, Suttons Bay, Mich., assignor to Marion Van Slooten, West Olive, Mich., a part interest

Filed Nov. 12, 1981, Ser. No. 320,220

Int. Cl.⁴ B07C *5/10*

U.S. Cl. 209—586 **3 Claims**

1. A seedling grading machine for sorting and collecting seedling trees according to size comprising:

a transfer conveyor means for conveying the seedlings one at a time along a predetermined path in aligned positions, said transfer conveyor means comprising a longitudinal grate formed of a plurality of spaced parallel bars, the seedlings being positioned transversely across the grate, and carrier means in communication with said grate for moving the seedlings rearwardly on the grate, said carrier means comprising:

lower carrier means positioned below a front portion of the grate for conveying the seedlings from the front toward the back of the grate, the lower carrier means comprising a plurality of equally spaced sets of transversely adjacent carrier rods that are attached to a movable conveyor and extend upwardly through the

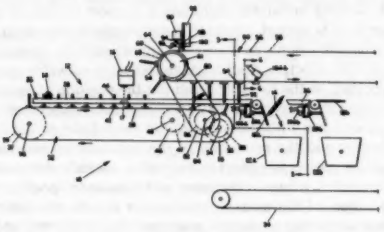
grate so as to engage and move the seedlings from the front toward the rear of the grate; and

upper carrier means positioned adjacent the rear end of the lower conveyor means for continuing the movement of the seedlings along the grate after the end of the front carrier means, the upper carrier means comprising a series of equally spaced sets of transversely adjacent upper carrier rods that are attached to a rearwardly moving conveyor positioned above the grate and spaced at the same intervals as the lower carrier rods, the upper carrier rods extending downwardly to engage and move the seedlings rearwardly on the grate;

electronic photocell control means positioned adjacent the transfer conveyor means for measuring the height of each seedling as it is conveyed along the path, said photocell control means comprising:

photocell means positioned adjacent the grate for measuring the height classification of each seedling and generating an output signal representative thereof;

a plurality of mechanical limit switch actuators mounted on the upper carrier means, the limit switch actuators being formed in sets of individual limit switch actuators spaced transversely across the upper carrier means, with each limit switch actuator corresponding to one size classification and occupying a predetermined transverse position for that size classification, one set of limit switch actuators being provided for each set of carrier rods, the limit switch actuator sets being spaced longitudinally apart along the upper carrier means by the same



distance as the carrier rod sets, each limit switch actuator being movable between an actuated and a deactuated position;

electrically actuated trip solenoid means mounted adjacent the upper carrier means for moving the limit switch actuators to their actuated positions, the trip solenoid means comprising a plurality of trip solenoids spaced transversely across the upper carrier means, with one trip solenoid being positioned at the predetermined transverse location for each size classification, the trip solenoid means being responsive to the photocell means such that when the photocell means indicates the presence of a seedling of a given size classification, the trip solenoid corresponding to that size classification is actuated, and such actuation moves the next limit switch actuator in the upper carrier means to its actuated position, the trip solenoid means being positioned such that the carrier rods corresponding to the actuated limit switch actuator will be the carrier rods that convey the particular measured seedling over gates; and

switch means for each gate positioned at a transverse location corresponding to the size classification of that gate, the switch means being positioned such that it will be actuated by an actuated limit switch actuator but will not be actuated by a deactuated limit switch actuator, the switch means being positioned such that the corresponding seedling will be positioned over its gate when the switch means is actuated, the switch means actuating a solenoid actuated means to open its corresponding gate when it is actuated;

said gates comprising a plurality of separated gates positioned along the transfer conveyor means downstream of the photocell control means, each gate opening downwardly to let any seedling positioned on the gate to drop downwardly through the conveyor, each gate corresponding to a given seedling size classification and being selectively actuatable by the photocell control means in accordance with the measured height of each seedling, the photocell control means opening the gate corresponding to the measured height of each seedling as the seedling passes over the appropriate gate; and

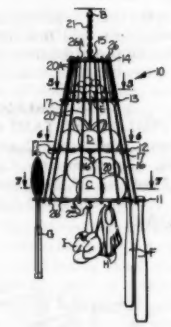
collector means for separately collecting seedlings dropped through each of the gates.

4,561,547

SUSPENDIBLE STORAGE ASSEMBLY

Joseph J. Estwanik, III, 1925 Clematis Dr., Charlotte, N.C. 28211

Filed Sep. 28, 1983, Ser. No. 536,541
Int. Cl.⁴ A47F *5/08, 7/00*
U.S. Cl. 211—14 **16 Claims**



1. A suspendible storage assembly for containment of sports equipment such as basketballs, soccer balls, and tennis balls and the like during nonuse comprising:

(a) a plurality of vertically spaced apart platforms for supporting sports equipment thereon; and

(b) a plurality of spaced apart elongate pliable supporting means cooperating with said platforms to maintain said platforms in multitiered assembly and to contain sports equipment on the platforms, and wherein at least some of said pliable supporting means are extensible and stretchable so as to be stretched and laterally deflected to facilitate passage of sports equipment therebetween and onto and from the platforms.

4,561,548

KNIFE HOLDER WITH FRONTAL SLOTS

Daniel D. Call, Athens, Wis., assignor to Oy Fiskars AB, Helsinki, Finland

Continuation of Ser. No. 459,478, Jan. 20, 1983, abandoned. This application Feb. 16, 1984, Ser. No. 580,884
Int. Cl.⁴ A47F *1/04, 1/00;* A47G *21/14*
U.S. Cl. 211—70.7 **10 Claims**

1. As an article of manufacture, a knifeholder for removably supporting a plurality of knives, each knife comprising a blade having a predetermined width, a predetermined thickness and a predetermined length, and a handle which is thicker than said blade, said handle having a terminal end and an opposite end which is transversely sloped relative to the longitudinal axis of said blade, said blade having a predetermined length measured

from the blade tip to the nearest part of said handle, said knife holder comprising:

an upper surface;

a lower surface;

a pair of side surfaces;

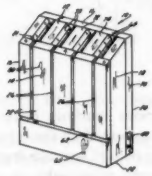
a front surface;

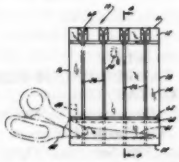
a rear surface;

said front and rear surfaces each being transverse to said upper, lower and side surfaces;

said upper surface sloping upwardly proceeding in the direction away from said front surface and toward said rear surface;

a plurality of blade-receiving slots, each blade-receiving slot extending uninterruptedly inwardly from said front surface for a distance greater than the predetermined width of a knife blade to be associated therewith and extending downwardly from said upper surface for a distance greater than





the predetermined length of a knife blade to be associated therewith, each blade-receiving slot having an upper end near said upper surface and a lower end near said lower surface, each blade-receiving slot being thicker than the predetermined thickness of a knife blade to be associated therewith and narrower than a knife handle to be associated therewith;

handle-engaging means located near the upper end of each blade-receiving slot and comprising projections located on both sides of a slot adjacent said front surface and extending upwardly relative to said upper surface;

and a single blade obstructing means located nearer to said lower end than to said upper end of each slot adjacent said front surface, said blade obstructing means having an upper side spaced from said upper surface at a distance less than said predetermined length of a blade to be associated therewith.

4,561,549

APPARATUS FOR SUPPORTING BABY TOYS

Nobuyuki Yokohori, 10-12, Minamisuna 6-chome, Kohto-ku, Tokyo, Japan

Continuation-in-part of Ser. No. 448,799, Dec. 10, 1982. This application Feb. 7, 1985, Ser. No. 699,449

Int. Cl.[4] A47F *5/14*

U.S. Cl. 211—182 **12 Claims**

3. An apparatus for supporting baby toys, said apparatus comprising:

means defining a base;

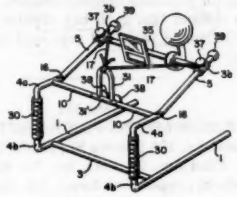
a pair of spaced, upwardly extending support members connected to said base means;

an oblique bar pivotally connected to and extending from each of said support members;

a reinforcing bar connected to and extending between said support members;

an upstanding support member extending upwardly from said reinforcing bar;

a connecting member extending between said oblique bars and substantially parallel to said base means, said connect-



ing member adapted to support baby toys above said base means, whereby the elevation of said connecting member above said base means can be adjusted by pivoting said oblique bars relative to said support members, and

adjusting means extending between and connected to each of said connecting member and said upstanding support member to maintain said oblique bars in a desired angular orientation relative to said support members.

4,561,550

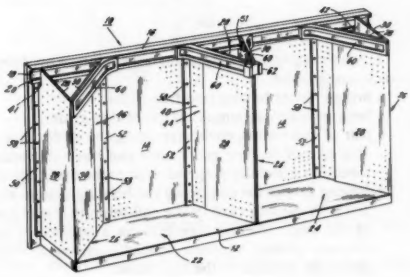
VARIABLE MULTI-BAY DISPLAY

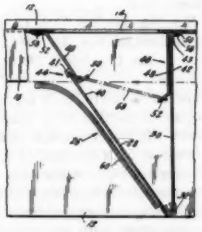
Robert P. Franklin, Lake Hopatcong, N.J., assignor to Trans-World Manufacturing Corporation, East Rutherford, N.J.

Filed Sep. 19, 1983, Ser. No. 533,213

Int. Cl.[4] A47F *5/00*

U.S. Cl. 211—184 **12 Claims**





1. A kit for making a multi-bay display, said kit including:

(A) a continuous rear wall;

(B) a plurality of bay dividers, each said bay divider including:

(1) first and second panels hingedly connected to one another, each said panel having a main surface which is generally rectangular in shape and which has a height and a width;

(2) at least one extension member;

(3) means for coupling each said extension member to a respective said panel in a manner which permits the effective width of the panel to which said extension member is coupled to be adjusted; and

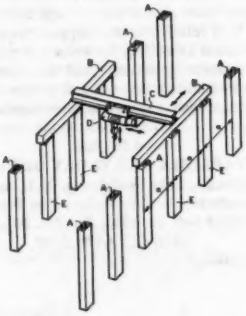
(C) means for attaching said bay dividers to said rear wall in such a manner that each bay divider forms a generally triangular shape with said rear wall to form a multi-bay display.

4,561,551

PROPULSION MEANS FOR HOISTING SYSTEMS

Doron Goussinsky, 106 Shvedia St., Haifa, Israel

Filed Aug. 25, 1983, Ser. No. 526,324
Claims priority, application Israel, Jul. 15, 1983, 69240
Int. Cl.[4] B66C *17/00*
U.S. Cl. 212—131 **18 Claims**



1. A hoisting system adapted to travel along a predetermined track, comprising:

a bridge girder having two free ends;

a hoist movably mounted on the bridge girder;

a pair of end-beams, each supporting the girder at a respective one of its free ends, each end-beam extending in a direction generally perpendicular to the bridge girder; and

a driving system for displacing the hoisting system along the track by causing each of the end-beam to travel generally in the perpendicular direction on a respective series of discrete gliding supports spacedly arranged along and generally parallel to the said track.

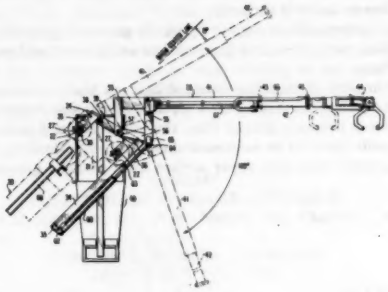
4,561,552

ATTACHMENT JIB FOR CRANES

Russell L. Sterner, Greencastle, Pa., assignor to Kidde, Inc., Saddle Brook, N.J.

Division of Ser. No. 310,768, Oct. 13, 1981, Pat. No. 4,493,426.
This application Sep. 24, 1984, Ser. No. 653,566
Int. Cl.[4] B66C *23/56, 23/04*
U.S. Cl. 212—261 **4 Claims**

1. In a crane boom having a fly section carrying a nose block including a pair of parallel cross shafts supporting upper and lower sheaves, the improvement comprising a support base releasably coupled with the pair of cross shafts on the crane boom, said support base comprising a frame having spaced opposite side arms straddling the nose block of the crane boom and the arms having engaging elements at their ends releasably locked in engagement with the projecting shafts on opposite sides of the nose block, a jib structure including at least one extensible and retractable section, a separate hydraulic cylinder inside said jib structure operable to extend and retract said section, a framework carrying the jib structure and projecting from one end thereof near the base of the jib structure, said framework comprising a box-like frame having one corner thereof pivotally connected to the support base between said side arms and spaced from the longitudinal axis of the jib structure, an adapter element at the leading end of said jib structure adapted to be releasably coupled to a mating adapter



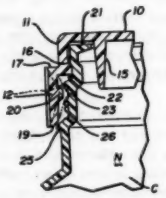
element of various working devices, and hydraulic luffing cylinder means mounted on the support base and connected to a second corner of said box-like frame on one side of the support base in spaced relationship to the pivot axis of said box-like frame, whereby the jib can be pivoted through a very wide luffing angle.

4,561,553

SNAP ON TWIST OFF TAMPER-PROOF CLOSURE FOR CONTAINERS

Clem C. Crisci, New Castle, Pa., assignor to Northern Engineering and Plastics Corp., New Castle, Pa.

Filed Jan. 22, 1985, Ser. No. 693,461
Int. Cl.[4] B65D *41/48*
U.S. Cl. 215—256 **5 Claims**



1. In a resilient molded plastic closure for a container of the type having a neck surrounding an opening to the container and having dual closure retaining means on said neck; said closure comprising means for covering said opening to said container and a depending annular flange surrounding said neck; said depending flange having dual means for engaging said retaining means, one of said dual means for comprising an annular groove forming a frangible wall positioned in the inner surface of said depending annular flange, the portion of the depending flange below said annular groove defining a tear skirt, said tear skirt having a pull tab affixed thereto, circumferentially positioned thread-like ribs on the inner surface of said depending flange above said annular groove, said closure retaining means on said neck including circumferentially positioned thread-like ribs, said thread-like ribs on said depending annular flange being engagable with said thread-like ribs on said neck only when portions of said depending annular flange are moved inwardly toward one another.

4,561,554

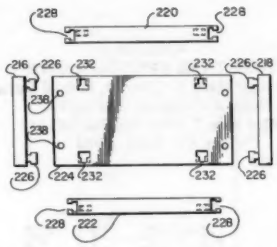
CONTAINER FOR PRODUCE, FRUITS GROCERIES AND THE LIKE

Edmund J. Swincicki, 1340 N. Congress Lot 33; Sunshine Lake Estate, Newport, Richey, Fla. 33552

Continuation-in-part of Ser. No. 305,737, Sep. 25, 1981, abandoned. This application Jan. 13, 1984, Ser. No. 570,689

Int. Cl.⁴ B65D *6/16, 21/02, 43/12*

U.S. Cl. 220—4 F **3 Claims**



1. A container for produce, fruit, groceries, dairy products, and the like comprising:

a hollow container of substantially rectangular shape, said container including laterally spaced normally vertical side walls and laterally spaced normally vertical end walls connecting the side walls at the respective opposite ends of the container, the container further including a bottom wall closing the lower end of the container, the end walls having inwardly projecting T-shaped tongues which are adapted to be slided into and engaged by T-shaped receiving grooves in the side walls, the ends walls are also provided with downwardly projecting pegs that engage receiving apertures in the bottom wall of the container, the side walls are provided with downwardly. projecting T-shaped tongues which are adapted to be inserted into T-shaped apertures in the bottom wall and are locked in place by pushing the side walls outwardly when the T-shaped tongues are inserted into the bottom wall;

a lid fastened to the container by bolts having heads, said lid having wells to allow for the recessing of the bolt heads and also having a plurality of grooves on top of the lid;

a plurality of rails formed on the bottom wall of said container adapted to fit into the grooves on the lid of an identical container to facilitate stacking;

ventilating passage means formed in at least one of the walls of said container; and

a liner member positioned on the inside of said container on the bottom wall to serve as a cushioning device for material positioned in said container.

4,561,555

PLASTIC CONTAINER HAVING ENLARGED FREE END PORTION FOR RECEIVING A METAL END UNIT BY DOUBLE SEAMING

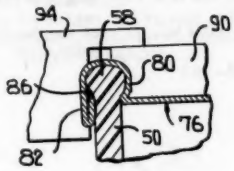
Bryan H. Miller, Nashua, N.H., assignor to Continental Plastic Beverage Bottles, Inc., Stamford, Conn.

Filed Dec. 13, 1984, Ser. No. 681,060

Int. Cl.⁴ B65D *41/12*

U.S. Cl. 220—67 **5 Claims**

1. A can component comprising a body having an integral bottom wherein said body and bottom are formed of biaxially oriented polyester, and said body has an open top defined by a free upper edge portion showing evidence of heating and



resultant shrinking to define in cross section a transversely enlarged rounded part.

4,561,556

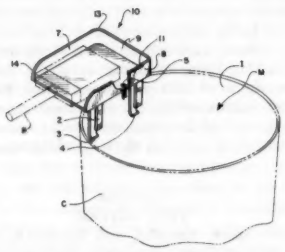
HOLDER FOR PAINT BRUSHES, ROLLERS OR THE LIKE

Roger J. Bendix, P.O. Box 782, Carmichael, Calif. 95608

Filed Feb. 1, 1984, Ser. No. 575,911

Int. Cl.⁴ B65D *25/00*

U.S. Cl. 220—90 **10 Claims**



8. In a holder for implements adapted to be placed on a container,

support means for supporting said holder in cantilevered relation away from an open face of the container,

means for altering the amount of coating liquid to be placed on a coating implement formed integral with said holder,

means for facilitating drainage of excess coating liquid from said holder back to said container,

said support means including first and second pairs of clips adapted to straddle inner and outer surfaces of a vertical wall of the container,

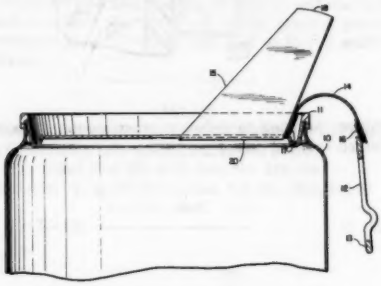
said clips including a downwardly declinated leg and skewed relative to a vertical plane adapted to engage an inner wall of said container, and a vertical leg in radial registry therewith adapted to be disposed on an outer wall of said container having an arcuate terminal portion at a lower horizontal elevation than said first named leg whereby added mechanical advantages are provided by said arcuate tip and said longer leg to provide the cantilevered support, and

wherein said drainage means includes a drainage hole in overlying registry with the container and funnel means for directing liquid through the drainage hole into the container formed on a bottom face of said support surface.

4,561,557
BEVERAGE CONTAINER WITH A SANITARY DRINKING SPOUT

Sea C. Park, and In P. Park, both of 3836 Birchwood, Skokie, Ill. 60076

Filed Nov. 13, 1984, Ser. No. 670,893
Int. Cl.[4] B65D *41/32*
U.S. Cl. 220—90.2 **6 Claims**



1. A sanitary lid-drinking spout combination forming part of a beverage container which comprises:

a container top containing a removable panel position

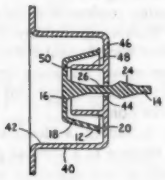
an opener attached to the outside surface of the lid at one end of the removable panel, and

a drinking spout attached to the inside surface of the lid and extending along the surface of the removable panel, whereby when the opener is pulled to remove the panel portion from the container top, the drinking spout, which is attached to said panel portion is repositioned to extend above the surface of the lid, said opener being securely attached to the removable panel and the removable panel being, in turn, releasably attached to the drinking end of the drinking spout whereby upon the pulling of the opener, the removable panel is separated from the drinking end portion of the drinking spout to extend down along the side of the container, while remaining attached to the other end portion of the drinking spout.

4,561,558
VENT COVER

Lonnie J. Richman, Eastlake, and Edward F. Stockmaster, Mentor, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Oct. 15, 1984, Ser. No. 661,014
Int. Cl.[4] B65D *51/16*
U.S. Cl. 220—203 **7 Claims**

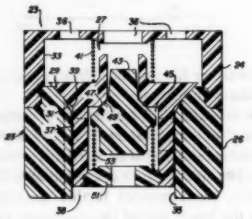


1. A device for venting an enclosure comprising a base member and a stem member connected to said base member, said stem member being received within an aperture in the enclosure and being slidingly movable within the aperture between a first position and a second position, said base member being in a non-contacting relationship with the enclosure when said stem member is in said first position and being in a contacting relationship with the enclosure when said stem member is in said second position and wherein said base member is cup-shaped and said stem member is directed outwardly from the bottom of said cup shape.

4,561,559
FUEL TANK VENTING VALVE

Fred E. Rutan, and Mark A. Chmelar, both of Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Nov. 7, 1984, Ser. No. 669,161
Int. Cl.[4] F16K *17/04*
U.S. Cl. 220—203 **1 Claim**



1. A pressure differentiating two-way vent valve sized for press mounting within a vent hose extending from the filler neck associated with a vehicle's fuel tank, comprising:

a generally cylindrical housing defined by a first section and a second section, said first and second sections being snap mounted together to define a first generally elongated cylindrical chamber, said second section further defining an inwardly directed first beveled landing and a contiguous inwardly directed second beveled landing within said chamber having a bevel angle greater than the bevel angle of said first beveled landing;

said first chamber having a plurality of apertures extending through said housing into said first section's end and a singular aperture extending through said second section's end;

a first elastomer plunger slidably mounted in said chamber in part defined by said second section and having an outwardly directed bevel flange portion form at one end of said first plunger matingly sized to said first bevel landing;

said first elastomer plunger defining a second chamber open at said second chamber's ends extending generally centrally therethrough, said first elastomer plunger further defining an outwardly directed second beveled landing at a point along said second chamber;

a second elastomer plunger slidably mounted in said second chamber, said second elastomer plunger having an outwardly directed bevel flange portion formed at a port therealong mating to and extending slightly beyond said second beveled landing;

an elastomer end plate enclosing one end of said second chamber and having an aperture tgherethrough cocentric to said singular aperture of said second section;

a first spring placed between and biased in compression by aid first section's end and said first plunger flange portion; and

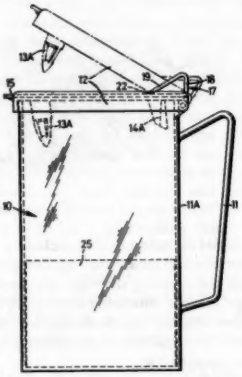
a second spring placed between and biased in compression said elastomer end plate and said flange of said second plunger.

4,561,560

LIQUID CONTAINER HAVING SLIDING CLOSURE MEANS

Christopher J. Lyon, 4668 Via Roblada, Santa Barbara, Calif. 93110

Filed Oct. 25, 1984, Ser. No. 664,722
Claims priority, application United Kingdom, Oct. 10, 1984, 8425611
Int. Cl.[4] B65D *17/44*
U.S. Cl. 220—278 9 Claims



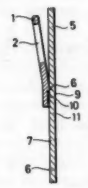
1. A liquid container comprising a closed vessel, there being two apertures in the top of the vessel, one serving as an outlet through which liquid can be poured from the container and the other serving as a vent hole, a closure member and constraining means whereby the closure member is constrained for sliding movement relative to and in contact with the vessel between one position in which it closes the two apertures and another position in which both the apertures are open to allow discharge of liquid from the container through the outlet; wherein the vessel is provided with a handle and the closure member is offset relative to the handle so that it can be moved between said two positions by application of a thumb of a hand by which the handle is gripped.

4,561,561

CONTAINER HAVING AN EASY OPENING END WITH A TAB AFFIXED BY ULTRASONIC WELDING

Masashi Ichikawa; Yasuo Takahashi, and Tohru Saito, all of Sagamihara, Japan, assignors to Nippon Steel Corporation, Japan

Filed Sep. 14, 1984, Ser. No. 650,509
Claims priority, application Japan, Sep. 26, 1983, 58-176200
Int. Cl.[4] B65D *17/34*
U.S. Cl. 220—270 5 Claims



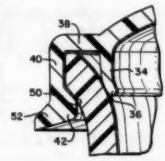
1. A container having a top wall made of a surface-treated steel sheet, and a tab made of stainless steel sheet or tin-free steel sheet ultrasonically welded to said top wall.

4,561,562

CONTAINER AND CLOSURE ASSEMBLY

Edgar F. Trombly, Grosse Pointe Farms, Mich., assignor to Thermo-Serv, Inc., Anoka, Minn.

Continuation of Ser. No. 457,691, Jan. 13, 1983, abandoned. This application Aug. 6, 1984, Ser. No. 609,642
Int. Cl.[4] B65D *41/16*
U.S. Cl. 220—306 6 Claims



1. A container and closure assembly wherein said container comprises:

a base connected to an upwardly extending annular wall that terminates at an outwardly flared rim defining the opening of the container, said rim having a uniform wall thickness substantially throughout its longitudinal extent with an outer face and a top edge sealing surface;

said closure overlying the container opening and comprising:

a center portion merging into an upraised annular shoulder which extends radially outward and upward to a ridge, an annular top wall region in the shape of a truncated dome connecting the ridge to a peripheral rim structure;

said rim structure sealingly engaged to the flared rim of said container comprising a downwardly extending inner sealing ring having a deflectible free end, a flexible transversely extending web connecting the ring to an outer downwardly extending rim wall having at its lower end an inwardly directed bead, said bead having an inner surface that inclines upwardly to the inside face of the rim wall, said inner surface extending downwardly and outwardly from said innermost edge to define a skirt portion at the base of said rim wall, said bead and free end being spaced-apart by the web a distance less than the thickness of said container rim engaged therebetween, the underside of said web having an annular surface corresponding to the container top edge surface for sealing engagement therewith.

4,561,563

INSULATED COOLER FOR BEVERAGE CONTAINERS

David E. Woods, 2647 Kodiak Ct., Houston, Tex. 77067

Filed Aug. 10, 1984, Ser. No. 639,455
Int. Cl.[4] B65D *25/34, 43/18, 47/08, 47/20*
U.S. Cl. 220—412 16 Claims

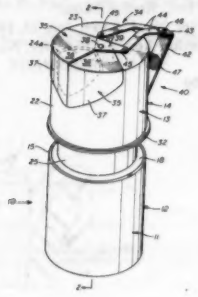
1. An insulated enclosure for containers comprising in combination:

an insulated upper cup-shaped cylindrical member adapted to receive and partially enclose a container of a consumable product and having a continuous top and side opening operable to be located over a top opening in said consumable product container,

an insulated lower cup-shaped cylindrical member adapted to receive and partially enclose a container containing a consumable product, and fitting said upper member to form a complete enclosure around said container,

closure means mounted on said upper member in position to open and close said opening therein and operable by the user of said enclosure to selectively expose said container opening, and

said upper member opening being of a size and shape when open to expose a portion of the top and side surfaces



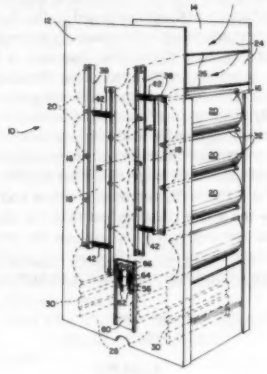
adjacent said opening of said container sufficient to allow the user to directly consume the contents therefrom.

4,561,564

ARTICLE DISPENSING MECHANISM FOR A VENDING MACHINE OR THE LIKE

Hideo Negishi, Isesaki, Japan, assignor to Sanden Corporation, Isesaki, Japan

Filed Aug. 23, 1984, Ser. No. 643,685
Int. Cl.[4] B65D *83/00*
U.S. Cl. 221—64 **4 Claims**



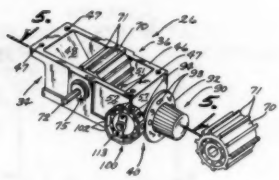
1. In an article dispensing mechanism for a vending machine including a pair of side plates facing one another at a predetermined spacing and at least one pair of serially cusp-shaped vertical panels disposed transversely between said side plates, said panels facing each other to define a serpentine track, an upper open end of said serpentine track being connected to an article loading space and a lower open end of said serpentine track being connected to an article discharge space, and a discharge control device associated with said discharge space to control the dispensing articles, the improvement comprising at least one of said panels being mounted on said side plates to be horizontally movable by a plurality of supporting members projecting from the movably mounted panel, each said supporting member extending into a slot in a side plate, a plurality of said supporting members being connected by means of a first connecting plate, a plurality of said supporting members being connected by means of a second connecting plate adjacent said first connecting plate and biasing means connecting said adjacent connecting plates such that they are drawn toward each other.

4,561,565

RATE ADJUSTMENT FOR CHEMICAL METER

Lester C. Wolf, and William R. Lundie, both of East Moline, Ill., assignors to Deere & Company, Moline, Ill.

Filed Oct. 28, 1983, Ser. No. 546,689
Int. Cl.[4] B67D *5/22*
U.S. Cl. 222—28 **14 Claims**



1. In a material metering device including a housing having a discharge orifice and means for regulating the rate of flow of material from the housing through the discharge orifice, the flow rate regulating means being selectively movable between a first position wherein the discharge orifice is closed and a second position wherein the discharge orifice is fully open, the improvement comprising:

a rotatable actuator operably connected to the flow rate regulating means, said actuator having actuator indicia spaced thereon, said actuator indicia being selectively registerable with a predetermined reference point;

a rotatable follower wheel attached to said housing and operably connected to said actuator and being movable in response to the rotational movement of said actuator, said follower having follower indicia spaced thereon, said follower indicia being selectively registerable with said predetermined reference point and said actuator indicia and

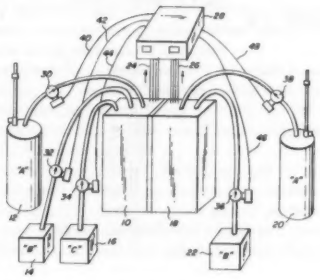
a drive lug attached to and extending out from said actuator, and a plurality of driven lugs attached to and extending out from said follower wheel, wherein said drive lug is disposed to contact one of said driven lugs and rotate said follower wheel when said drive lug is rotated past said predetermined reference point.

4,561,566

AUTO FLOW CONTROLLER

Lev Slobodnik, 185-01 Hillside Ave., Apt. 5-P, Jamacia, N.Y.

Filed Feb. 2, 1984, Ser. No. 576,370
Int. Cl.[4] B67D *5/08*
U.S. Cl. 222—56 **2 Claims**



1. An auto flow controller for controlling quantity of vari-

ous liquid components delivered to a mixing tank in which a solution is to be prepared, comprising in combination:

a plurality of mixing tanks;

a plurality of holding containers to store liquid components of solution to be mixed in said mixing tanks;

means for causing said liquid components to be carried to said mixing tank;

means for initiating the re-filling of said mixing tank when said mixing tank falls below some predetermined level; and

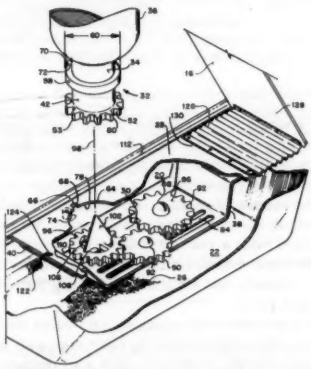
means for controlling precisely the quantity of each of said liquid components which are carried to said mixing tank, wherein said means for controlling precisely the quantity of each of said liquid components which are carried to said mixing tank comprises a float which initiates the refilling process by activating a micro switch when said mixture falls below a predetermined level; pumps which cause said liquid components to be conducted to said mixing tanks for as long as said pumps are activated, timers with auto reset which activate said pumps and a signal receiver which senses the closure of the contacts of said micro switch and causes each of said timers to start thereby causing each of said pumps to deliver a predetermined amount of liquid to said mixing tank.

4,561,567

TONER LOADING APPARATUS

Martin D. Wittstein, Fairfield, and Christian A. Beck, Ridgefield, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Jan. 20, 1984, Ser. No. 572,276
Int. Cl.[4] B67B 7/48
U.S. Cl. 222—83.5 **5 Claims**



1. In a xerographic copying machine having instrumentalities for making xerographic copies of original documents, one of said instrumentalities being a toner developing apparatus which utilizes dry toner stored in a supply container, apparatus for periodically loading toner into said supply container, said apparatus comprising:

A. a bottle having a neck adjacent one end thereof and defining a dispensing opening from said bottle;

B. a frangible sealing member secured to said neck and normally sealing said dispensing opening;

C. cutting means rotatably mounted on said copying machine adjacent said supply container, said cutting means comprising a member extending substantially across said dispensing opening and having an upwardly projecting piercing point and being mounted for rotation about a substantially central vertical axis of said member;

D. first and second cooperating connecting means respectively mounted on said copying machine adjacent said supply container and on said bottle adjacent said neck for removably connecting said bottle to said copying machine in a position such that said piercing point pierces said sealing member and said dispensing opening is disposed adjacent said supply container; and

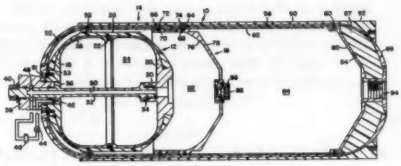
E. first and second actuating means mounted respectively on said copying machine and said neck of said bottle and interconnected between said cutting means and said bottle for causing rotation of said cutting means relative to said bottle in response to rotation of said bottle so that said cutting means cuts said sealing member around substantially the periphery of said neck to expose said dispensing opening, thereby allowing toner in said bottle to flow by gravity through said dispensing opening and into said supply container.

4,561,568

LIQUID FUEL EXPULSION SYSTEM

Lawrence D. Hoffmeister, New Market; Jimmy M. Madderra, and Richard J. Thompson, both of Huntsville, all of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 2, 1984, Ser. No. 585,704
Int. Cl.[4] B67D 5/42
U.S. Cl. 222—130 **10 Claims**



1. A liquid expulsion system comprising a first tank including inner tank structure and composite reinforcing material mounted about said inner tank structure and said first tank being designed for containing a pressurized fluid therein, a second and larger tank secured to an mounted about said first tank and completely enclosing said first tank and defining a chamber in said second tank for the storage of fuel, and said second tank being constructed of metal inner structures that are sealably and slidably mounted together to form a metal inner structure that includes forward and aft ends with intermediate cylindrical structure and with helical and hoop reinforcing outer layers of composite material mounted about said metal inner structure to enable the second tank to be made to enclose said first tank and provide a compact and lightweight packaging arrangement of the tanks and means sealing said first tank and said second tank at a front dome portion of said first tank and at said forward end of said second tank.

4,561,569

THERMOPLASTIC DISPENSING DEVICE WITH OUTLET COOLING CHAMBER

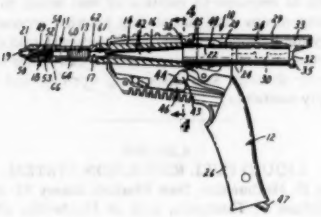
Michael M. Dziki, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Jan. 12, 1984, Ser. No. 570,246
Int. Cl.[4] B67D 5/62
U.S. Cl. 222—146.5 **2 Claims**

1. In a device for dispensing molten themoplastic material comprising a frame, a barrel member mounted on said frame and having an internal melting chamber communicating with an outlet opening through a nozzle, a sleeve with a through opening having one end secured to said barrel member with said through opening communicating with the end of said melting chamber opposite said outlet opening, said sleeve being adapted to receive a block of solid thermoplastic material with one end portion of the block in the melting chamber and the block projecting through said sleeve, means for heat-

ing said barrel member to a predetermined temperature to melt the end portion of the block therein, and means for affording pressing of the block through the sleeve and into the melting chamber to force molten thermoplastic material out said outlet opening, the improvement wherein:

said device further includes a heat conductive wall defining a cooling chamber having a volume at least as great as the volume of said melting chamber removably positioned



between said barrel member and said nozzle, said conductive wall having a peripheral surface area of transverse cross sectional area ratio that provides more heat radiation from said wall than heat conduction from said barrel member so that when molten thermoplastic material is not being dispensed, said heat conductive wall produces a molten thermoplastic temperature in said cooling chamber of at least 30 Fahrenheit degrees less than the molten thermoplastic temperature in said melting chamber.

4,561,570

AUTOMATIC LOCKING DEVICE FOR A FLEXIBLE CONTAINER

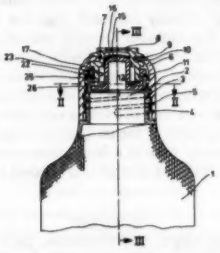
Karlheinz Zulauf, Höchst-Hassenroth, and Rudolf Egner, Pfungstadt, both of Fed. Rep. of Germany, assignors to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany

Filed Oct. 20, 1983, Ser. No. 544,001

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1982, 8235857[U]

Int. Cl.⁴ B67D *5/06*

U.S. Cl. 222—153 **11 Claims**



1. An automatic locking device for a flexible container for accommodating a fluidic or pasty filler, particularly skin cream, shampoo or the like, and having a substantially cylindrical neck portion formed with a through passage, comprising a locking cap superimposing said through passage and having an opening; a lip valve of a resilient material mounted in said opening of the locking cap; and a sealingg member positioned in said through passage and partially extended outwardly therefrom and cooperating with said lip valve for sealingly closing said through passage, said locking cap with said lip valve being displaceable relative to said neck portion in the direction of the elongation thereof, said lip valve including two opposing lips which release a slot therebetween for passing the filler therethrough upon application of pressure to said container and sealingly close said slot when said pressure is released, said lip valve further having a supporting portion having a firstt sealing surface (16) at which said sealing member cooperates with said lip valve and a second sealing surface (12) arranged in contact with said sealing member.

4,561,571

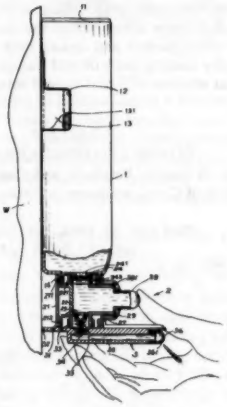
WASHING LIQUID SUPPLIER

Jason K. S. Chen, 306, E. 30th, #2, Austin, Tex. 78705

Filed Aug. 29, 1983, Ser. No. 527,431

Int. Cl.⁴ B65D *37/00*

U.S. Cl. 222—207 **1 Claim**



1. A washing liquid supplier comprising: a container filled with washing liquid and formed with two holding grooves to engage with two hooks of holding bracket fixed on a wall, said container having an opening;

a valve means fixed under said container; and a discharge pipe, horizontally fixed under said valve means and formed with a rear extension to terminate on the fixing wall and terminated on its front end with a resilient sealer to resiliently seal a discharge opening formed on the end of said pipe;

the improvement comprising: said valve means including an outer cylinder upperly connected with said container and lowerly connected with said discharge pipe; and inner cylinder formed within said outer cylinder and in communication with said discharge pipe; an upper valve seat formed in said container opening; a lower valve seat formed in said inner cylinder; a suction valve pivotedly and upwardly sealing against said upper valve seat; a discharge valve resiliently and upwardly sealing against said lower valve seat; said inner cylinder, said suction valve, and said discharge valve difining a pumping chamber;

a side arm portion transversely communicated with said inner cylinder;

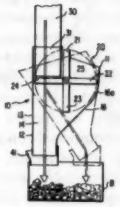
a cap having a centrally formed button hole, said cap being attached to said side arm portion;

a resilient nipple button extending through said button hole and mounted between said side arm portion and said cap, whereby said nipple button is depressed to boost washing liquid in said pumping chamber through said discharge pipe into the user's hand for direct and convenient use.

4,561,572
APPARATUS FOR DISPENSING BULK GOODS

Bruno Grüindler, Neuhausen am Rheinfall, Switzerland, assignor to SIG Schweizerische Industrie Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Oct. 13, 1983, Ser. No. 541,662
Claims priority, application Switzerland, Oct. 27, 1982, 6279/82
Int. Cl.⁴ B65D *88/26*
U.S. Cl. 222—410 8 Claims



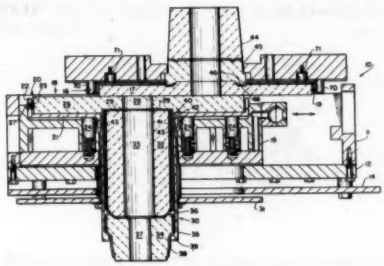
1. An apparatus for dispensing bulk material comprising
(a) a supply chute having an outlet;
(b) an openable and closable gate in said supply chute for controlling discharge of the bulk material from said outlet;
(c) a downwardly oriented funnel extending below the outlet of said supply chute; said funnel including
(1) an inlet zone receiving material from said outlet of said supply chute and defining a generally downwardly oriented, substantially unobstructed path for the material from said outlet of said supply chute throughout said inlet zone;
(2) a discharge opening situated below said inlet zone for discharging material from the apparatus;
(3) a generally vertically oriented, generally planar wall extending from said inlet zone to said discharge opening; and
(4) a constricted flow passage area below said inlet zone;
(d) a rotor of flat construction situated in said inlet zone in the vicinity of said wall between said outlet of said supply chute and said constricted flow passage area; said rotor including a generally horizontally supported shaft and revolving impeller means having a path of rotation spaced from said outlet in a horizontal direction; said path of rotation extending parallel to said wall and bounding said unobstructed path; and
(e) means for pivotally supporting said funnel on said shaft for swinging motion in a vertical plane.

4,561,573
VALVE AND REPLACEABLE COLLECTOR NOZZLE

James T. Shapland, Champaign, Ill., assignor to Flo-Con Systems, Inc., Champaign, Ill.

Filed Aug. 20, 1982, Ser. No. 410,010
Int. Cl.⁴ B22D *41/08*
U.S. Cl. 222—600 42 Claims

1. A sliding gate valve and replaceable collector nozzle comprising, in combination
a sliding gate valve having a stationary plate, a sliding gate, and means for securing the stationary plate and sliding gate in pressure relationship and in teeming relationship with an orifice at a lower portion of a teeming vessel,
the means for securing the stationary plate and sliding gate in pressure relationship being beneath the sliding gate,
an independent spring loaded metallic pressure distribution plate for aligning independent refractory members, each member having a teeming opening, one such member being a collector nozzle,
the pressure distribution plate having an annulus proportioned to receive a collector nozzle,
said pressure distribution plate being positioned between the sliding plate and the means for securing the sliding gate and stationary plate in pressure relationship and in non-sliding relationship to the sliding gate,
a collector nozzle holding means on the pressure plate adjacent said annulus,

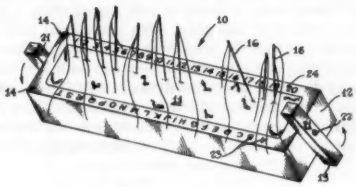


a replaceable collector nozzle,
and engaging means at the upper portion of the collector nozzle for engaging with the pressure plate collector nozzle holding means.

4,561,574
STITCHERY NEEDLE BOARD

Luba Brown, 539 W. Corona, Pueblo, Colo. 81004

Filed Mar. 22, 1984, Ser. No. 592,132
Int. Cl.⁴ A41H *31/00*
U.S. Cl. 223—109 R 1 Claim



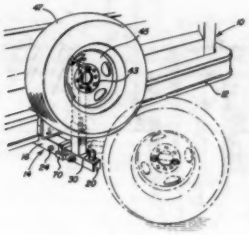
1. A stitchery needle board apparatus adapted to retain and support a plurality of stitchery needles having a different colored thread associated with each of said plurality of needles wherein the apparatus consists of:
a pin cushion unit comprising a penetratable member;
an elongated, generally rectangular, pin cushion enclosure unit forming end members and generally open elongated side members, fabricated of generally rigid material, and surrounding at least the periphery of the pin cushion unit, so that a major portion of the surface area of the pin cushion unit is exposed thru both of the generally open elongated side members of said enclosure unit;
a pair of elongated rectangular support legs whose height is only equal to the height of the ends of the enclosure unit, and which are pivotally connected at their midpoints to the midpoints of the ends of the enclosure unit, whereby the enclosure unit may be supported by the support legs at a variety of angles with respect to the vertical; and,
a plurality of indexes disposed on both generally open elongated sides of the enclosure unit adjacent the exposed portion of the pin cushion, wherein the said plurality of indexes consists of at least one alphabetical index and at least one numerical index and wherein the said plurality of indexes are arranged on each elongated side of the enclosure unit in an inverted and in an upright disposition such that only one of said plurality of indexes will be visible in a readable manner at any given time to a user of the apparatus.

4,561,575

SWING AWAY TIRE CARRIER AND HITCH

Robert R. Jones, c/o Russell Bartling 1335 W. 12th St., Fremont, Nebr. 68025

Filed Jan. 4, 1984, Ser. No. 568,116
Int. Cl.[4] B62D *43/02*
U.S. Cl. 224—42.21 **11 Claims**



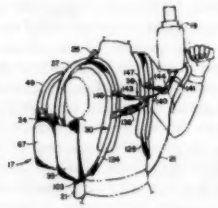
1. In combination with a vehicle including a generally straight marginal portion, an upstanding open side sleeve stationarily mounted from said vehicle outwardly of said marginal portion and opening laterally along said marginal portion, an upstanding arm including a first upper end and a second lower end snugly laterally received in said sleeve in a stored position therewithin, the upper end of said arm projecting above said sleeve and including means for supporting a vehicle wheel therefrom with the medial plane of said wheel generally paralleling said marginal portion, and dual pivot axis support means mounting the lower end of said arm for successive swinging, only, relative to said sleeve about a first axis disposed normal to said plane from said stored position to a horizontally outwardly projecting horizontal position generally paralleling said marginal portion and with said lower end angularly displaced completely outwardly of the open side of said sleeve and then about a second upstanding axis disposed outward of the confines of said sleeve to swing said first end horizontally outwardly from said vehicle marginal portion.

4,561,576

VIDEO EQUIPMENT BAG

Greg E. Lowe, Boulder, and Harold A. Jordan, Littleton, both of Colo., assignors to Lowe Alpine Systems, Inc., Lafayette, Colo.

Filed Dec. 13, 1983, Ser. No. 560,914
Int. Cl.[4] A45F *3/02*
U.S. Cl. 224—209 **23 Claims**



1. An equipment bag, comprising:

first enclosure means having bottom, top, and a plurality of side walls defining a first compartment area within said first enclosure means;

second enclosure means having bottom, top, and a plurality of side walls defining second and third compartment areas within said second enclosure means, one of said plurality of side walls of said first enclosure means being adjacent to one of said plurality of side walls of said second enclosure means;

compartment area accessing means including first and second access means, said first access means being in a wall of said first enclosure means to provide access to said first compartment area and said second access means being in a wall of said second enclosure means to provide access to at least one of said second and third compartment areas, one of said first and second access means providing a control access means and being in one of said plurality of side walls so that said compartment area having said control access means associated therewith is adapted to receive a first component of equipment that is normally retained during use in said equipment bag with said first component of equipment having operational controls thereon and usable with other components of said equipment, and with said first equipment component being positioned so that said operational controls are maintained adjacent to said control access means; and

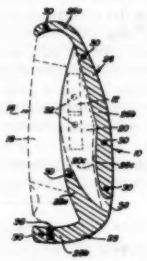
multiple carrying means connectable with at least one of said first and second enclosure means to adapt said equipment bag for carrying during use whereby said bag can be oriented at least in substantially an upright position and in a position substantially normal to upright with said control access means being in each case adjacent to a user so that manipulation of said operational controls of said first component retained in said bag is facilitated.

4,561,577

KNIFE HOLSTER

Thomas L. Moore, P.O. Box 172, Higganum, Conn. 06441

Filed Sep. 12, 1984, Ser. No. 649,752
Int. Cl.[4] B26B *29/02*
U.S. Cl. 224—232 **9 Claims**



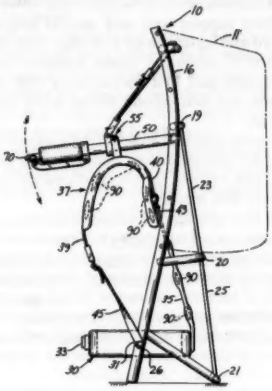
1. A holster for a knife having a body member and a folding blade, the holster comprising a sheath formed with means for gripping the ends of the body member when the blade is folded, and a blade catch for fitting between a tip end portion of the blade and the body member when the body member is gripped in the sheath, so as to prevent the blade from closing completely, and the catch pressing against the blade when the body member is pulled out of the sheath so as to unfold the knife, wherein the sheath includes a spine member against which an outer edge of the knife blade may be pressed when inserting the knife in unfolded condition into the sheath to provide a reaction surface for folding the knife by hinging the body member relative to the blade and wherein the sheath defines an opening at one end of said spine member adjacent the blade catch to aid discharge of foreign material from the knife when it is inserted in the sheath with the tip portion of the blade pointing downwards.

4,561,578

BACKPACK FOR HIKERS

Michael S. Bell, 354 Daytona, Goleta, Calif. 93117

Filed Oct. 17, 1984, Ser. No. 661,664
Int. Cl.[4] A45F 3/10
U.S. Cl. 224—262 17 Claims



1. A backpack comprising a first and a second generally upright rail and a pair of laterally extending cross-rails joining said upright rails to form a frame adapted to be carried at the back of a person and support a load to be carried, with the upright rails spaced apart, with a lower portion disposed at the side of the person, whereby said lower portions are at opposite sides of the person;

a waist-encircling belt attached to said lower portions, and including a separable buckle to enable the person to be encircled and held by said belt, or to be released from said belt;

a pair of rear risers attached to and rising from spaced apart locations at the rear of said belt;

a pair of shoulder rests each adapted to fit atop a respective shoulder with a front and rear leg, the rear legs being attached to respective rear risers;

a pair of front risers attached to respective said lower portions and to respective front legs, the lengths of at least one riser attached to each shoulder rest being adjustable;

a pair of balance rods pivotally mounted to said frame for up and down pivotal movement forward of said frame;

connection means connecting each of said shoulder rests to a respective balance rod, said connection means being adapted to connect said shoulder rests at a plurality of locations along the respective balance rod;

suspender means interconnecting an upper region of said frame with each of said balance rods, said suspender means being adjustable to determine the lowermost pivotal position of said balance rods; and

forward load-attachment means mounted to each of said balance rods forwardly of said frame for supporting a load forwardly of the person,

whereby the direct weight of the backpack can be carried exclusively by the belt, by raising the balance rods to lift the shoulder rests from the shoulders, can be carried by both the belt and the shoulder rests by adjusting the forward risers to bring the shoulder rests against the shoulders with the belt fastened, and carried entirely by the shoulder rests by releasing the belt; and

whereby the elevation of the shoulder rests can be adjusted by adjusting the length of a riser and a suspender means respective to each balance rod; and

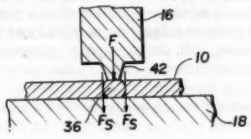
whereby a load can be suspended forwardly of the person by said forward load-attachment means.

4,561,579

PRECISION SLITTING OF MATERIAL

William F. Fleming, III, Winston-Salem, and Roger D. Jones, Clemmons, both of N.C., assignors to RJR Archer, Inc., Winston-Salem, N.C.

Filed Jan. 30, 1984, Ser. No. 575,052
Int. Cl.[4] B26D 7/27, 9/00; B26F 3/00
U.S. Cl. 225—2 6 Claims



1. An apparatus for slitting an endless strip of material into at least two endless strips of material, the material having substantially parallel planar surfaces, comprising:

at least one pair of scoring knives mounted in relative orthogonal alignment with respect to the planar surfaces of the material, the scoring knives of each pair of scoring knives being situated with one scoring knife on each side of the material, said scoring knives having cutting edges which form a pair of adjacent grooves in each surface of the material, said pair of adjacent grooves being orthogonally aligned; and

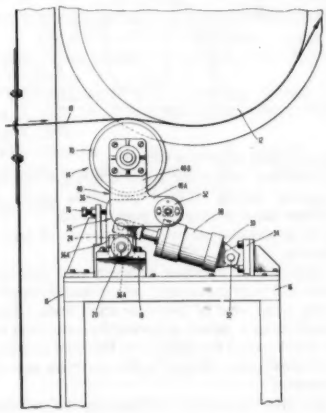
force applying means associated with each pair of scoring knives for applying a force normal to the planar surfaces of the material and between adjacent grooves and of sufficient magnitude to shear the material along a line connecting corresponding grooves.

4,561,580

APPARATUS FOR MEASURING THE TENSION IN AN ENDLESS ELONGATE MEMBER

George C. Trail, Jr., Matthews, N.C., assignor to Celanese Corporation, New York, N.Y.

Filed Aug. 22, 1984, Ser. No. 643,335
Int. Cl.[4] B65H 23/22; G01F 1/34
U.S. Cl. 226—45 11 Claims



1. In a tension measuring apparatus for the measuring of tension in an elongate member which is being advanced under tension, said apparatus being of the type comprising sensor support means carrying a rotatable sensing roll, actuating means for moving said support means to bring said sensing roll

into engagement with said elongate member such that said elongate member applies a reaction force against said sensing roll, torsion bar means operably connected to said sensing roll to be torsionally deformed thereby in response to the application of said reaction force against said sensing roll, and strain gages disposed on said torsion bar means to measure the extent of torsional deformation thereof, the improvement wherein said sensor support means comprises:

carrier means supported so as to be moved by said actuating means, said carrier means including a pair of arm portions spaced apart in a direction parallel to an axis of rotation of said sensing roll, said arm portions having inner ends and sections extending from said inner ends transversely relative to the direction of said reaction force;

said torsion bar means being fixedly connected to outer ends of said arm portions and extending therefrom generally parallel to said axis of rotation of said sensing roll;

a pair of torque members including sections having inner ends fixedly connected to said torsion bar means and extending therefrom generally parallel to said arm portions toward said inner ends of the latter, said sensing roll being carried by outer ends of said torque members;

said torque members defining moment arms for applying a torquing force to said torsion bar means in response to the application of said reaction force to said sensing roll, whereby said torsion bars are torsionally deformed and the extent of such deformation is sensed by said strain gages.

4,561,581

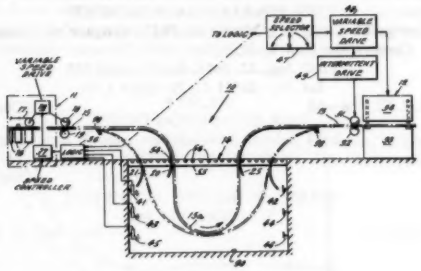
WEB ACCUMULATOR WITH ARCUATE GUIDE SUPPORTS

Thomas A. Kelly, 12074 White Lake Rd., Fenton, Mich. 48430

Filed Feb. 7, 1983, Ser. No. 464,359

Int. Cl.[4] B65H *17/20, 23/22, 25/10, 25/20*

U.S. Cl. 226—113 **8 Claims**



1. Production apparatus including:

a production device for manufacturing a traveling web of material having stiffness properties similar to those of double-faced corrugated paper board;

a web processing device downstream of said production device;

an accumulator disposed between said production device and said web processing device and through which said web, while void of tranverse score lines, travels in a path comprising a partial downwardly extending loop;

first drive means for delivering the web continuously from said production device to the upstream end of said accumulator;

second drive means for withdrawing the web intermittently from the downstream end of said accumulator and delivering the web to said web processing device;

a convex first means curved downwardly in a downstream direction for supporting said web from below as it enters said accumulator, a convex second means curved downwardly in an upstream direction supporting said web from below as it leaves said accumulator, said first and second means being operatively shaped to permit said web, as it enters and leaves said loop, to be supported along curves each having a radius approaching but no less than a critical radius below which unwanted transverse scores will form in the web;

said first means extending downward and downstream from a first fixed support and said second means extending downward and upstream of a second fixed support with there being a substantial space between said first and second means, said first means being free at its downstream end and said second means being free at its upstream end;

adjusting means operable to selectively adjust curvature of said first and second means, said adjusting means including first and second members extending transverse to direction of web travel;

each of the first and second means including a plurality of parallel slats spaced transverse to direction of travel of the web, said slats of said first means being connected to said first member downstream of said first fixed support and said slats of said second means being connected to said second member upstream of said second fixed support;

said first and second members being adjustably positionable upstream and downstream with respect to said fixed supports;

said first member being adjustably positionable lengthwise of said slats of said first means, and said second member being adjustably positionable lengthwise of said slats of said second means.

4,561,582

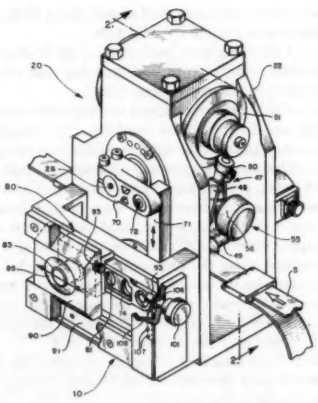
STRIP FEEDERS

Chester M. Wilg, Lincolnwood, Ill., assignor to F. J. Littell Machine Co., Chicago, Ill.

Filed Jul. 26, 1982, Ser. No. 401,608

Int. Cl.[4] B65H *17/22*

U.S. Cl. 226—142 **6 Claims**



1. In a strip feeder for feeding a continuous strip of material to a punch press or the like, the improvement comprising:

(a) cam means mounted for rotation in one direction on an input shaft;

(b) an output shaft;

(c) cam follower means mounted on said output shaft and adapted to follow said cam means and as it rotates with said input shaft whereby said output shaft is caused to oscillate through a precisely predetermined arc;

(d) a drive arm mounted on said output shaft for oscillation therewith;

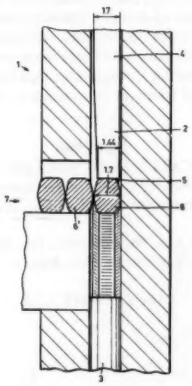
(e) a first drive lever mounted for pivotal movement on a pivot shaft;
(f) means pivotally interconnecting corresponding ends of said drive arm and said first drive lever;
(g) a second drive lever extending generally parallel to said first drive lever;
(h) said first and second drive levers being pivotally interconnected at one point;
(i) said second drive lever being fixed to a strip drive roll shaft at a point displaced from said one point whereby movement of said second drive lever at said one point is effective to rotate said drive roll shaft in one direction or the other;
(j) said pivot shaft being movable parallel to said first drive lever to vary its operative length; and
(k) control means for moving said pivot shaft whereby the operative length of said first drive lever is varied and the arc of travel of said drive roll shaft is correspondingly varied.

4,561,583

APPARATUS FOR CLOSING TUBULAR WRAPPERS

Herbert Niedecker, Am Ellerhang 6, D 6240 Königstein 2, Fed. Rep. of Germany

Filed Apr. 27, 1984, Ser. No. 605,011
Claims priority, application Fed. Rep. of Germany, May 6, 1983, 3316587
Int. Cl.⁴ B25C *7/26*
U.S. Cl. 227—109 **2 Claims**



1. In an apparatus for closing U-shaped closing clips about the mouth of a tubular wrapper, the apparatus including a clip passage to which the clips are guided after being supplied through a magazine, a reciprocable driver having a generally rectangular shank which generally conforms in cross-section to the clip-guiding passage, and a closing die, advance of said driver moving a clip from said magazine through said passage and against said die, the improvement wherein the shank of said driver is tapered in thickness toward its end face on that longitudinal side which faces the clip-guiding passage, the thickness of the driver being about 75 to 85% of the full thickness of the shank, whereby the apparatus can operate upon clips of different widths.

4,561,584

INTEGRATED CIRCUIT PACKAGE REMOVAL

Paul Hug, Santa Clara County, Calif., assignor to Storage Technology Partners, Louisville, Colo.

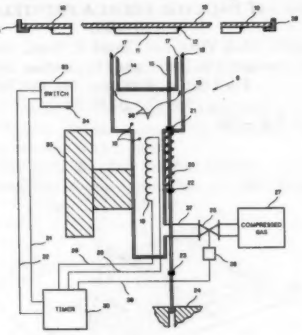
Filed Oct. 17, 1983, Ser. No. 542,828
Int. Cl.⁴ B23K *1/00, 3/02*
U.S. Cl. 228—19 **8 Claims**

1. An apparatus for removing circuit packages from a module to which a plurality protruding leads of the package are soldered comprising:

a fixture for holding said module such that the circuit package to be removed from the module lies on a downward facing side of said module;

a nozzle for directing a flow of heated gas and for catching said circuit package including:

an outer peripheral wall, the area encompassed by said outer wall being larger than the area defined by the body of said circuit package without considering said leads, but smaller than the area defined by said circuit package including said leads,



an inner peripheral wall spaced inwardly and apart from said outer peripheral wall, said hot pressurized gas being directed to flow between said outer and inner walls, the area encompassed by said inner wall being smaller than said circuit package,

whereby said package and leads are caught and held by the upper edge of said outer or inner walls when said package falls away from said module; and

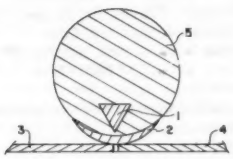
means for controllably directing said flow of heated gas through said nozzle to the leads of said package, whereby the hot gas melts the solder holding the leads to the module.

4,561,585

METHOD OF SPLICING METAL ELEMENTS BY MEANS OF EXPLOSION-WELDING

Per I. Persson, Nora, Sweden, assignor to Nitro Nobel A.B., Gyttorp, Sweden

PCT No. PCT/SE83/00015, § 371 Date Sep. 7, 1983, § 102(e) Date Sep. 7, 1983, PCT Pub. No. WO83/02579, PCT Pub. Date Aug. 4, 1983
PCT Filed Jan. 21, 1983, Ser. No. 537,384
Claims priority, application Sweden, Jan. 27, 1982, 8200437
Int. Cl.⁴ B23K *20/08*
U.S. Cl. 228—108 **13 Claims**



1. In a method of explosion welding to join together metal elements utilizing an explosive charge adjacent to the joint and a splicing element between said charge and said joint, the improvement comprising:

(a) locating said charge in an inert material such that the distance from said charge through said inert material in the direction toward said joint is less than the distance from said charge through said inert material in the direction opposite to said joint; and

(b) shaping said charge relative to said inert material and said metal elements such that the distance from said charge through said inert material to said metal elements increases as the lateral distance from said joint increases;

wherein said charge is substantially cylindrical in shape.

4,561,586

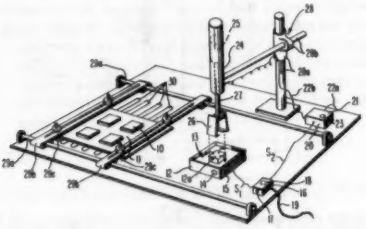
METHOD OF REMOVING A SOLDERED INTEGRATED CIRCUIT PACKAGE FROM A PRINTED CIRCUIT BOARD

Kenneth N. Abel, Vista, and Gerald R. Dunn, Carlsbad, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Sep. 4, 1984, Ser. No. 646,747

Int. Cl.[4] B23K *3/00*

U.S. Cl. 228—264 **10 Claims**



1. A method of removing an integrated circuit package that has multiple leads which are soldered into respective metal plated holes in a printed circuit board, said board being of the type that has internal metal lines which make joints with said metal plating and said method being adapted to remove said package from said board without overstressing said joints; said method including the steps of:

flowing a liquid on said leads at a temperature higher than the melting temperature of said solder without pulling on said package for a time period Δt_1; and

pulling on said package immediately after the end of said Δt_1 period with a force $F_1 = F_3 + (25 \text{ to } 75)\% F_2$;

wherein F_2 is the minimum force that will extract a single soldered lead from said board under the condition the solder is below but within 5° C. of melting; F_3 is the minimum force that will lift said package from a pool of said liquid; and Δt_1 is the time it takes to pull said package from said board with force F_1 being continuously applied while said liquid is flowing on the package leads to melt the solder plus one to three seconds.

4,561,587

FRAME MADE FROM PAPERBOARD AND HAVING LOCKABLE CORNERS

Lawrence S. Wysocki, Chicago, Ill., assignor to Champion International Corporation, Stamford, Conn.

Filed Nov. 26, 1984, Ser. No. 674,875

Int. Cl.[4] B65D *5/30*

U.S. Cl. 229—36 **2 Claims**

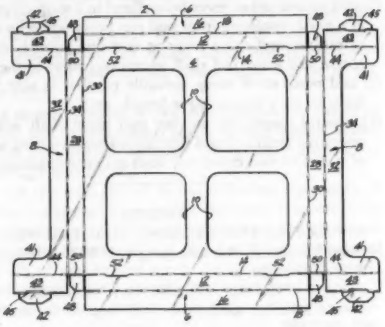
1. A frame formed from a one-piece paperboard blank, said frame comprising:

(a) a back wall panel;

(b) first and second opposed pairs of framing panels foldably connected to edges of said back wall panel, each framing panel including an outer side wall panel perpendicular to said back wall panel and a front wall panel spaced apart from and parallel to said back wall panel;

(c) said front wall panels of one of said opposed pairs of framing panels including end portions which project toward each other and are disposed in overlapping relationship with said front wall panels of the other of said opposed pairs of framing panels;

(d) overlay panels foldably connected to each of said front wall panel end portions, said overlay panels extending toward said back wall panel and being disposed in outwardly overlapping relationship with said outer side wall



panels of said other of said opposed pairs of framing panels;

(e) locking tabs articulated to ends of said overlay panels adjacent edges of said back wall panel; and

(f) locking slots formed in fold lines interconnecting said outer side wall panels and said back wall panel, said locking tabs extending through said locking slots to lock each corner of said frame in an expanded condition.

4,561,588

BIMETALLICALLY CONTROLLED STEAM TRAP

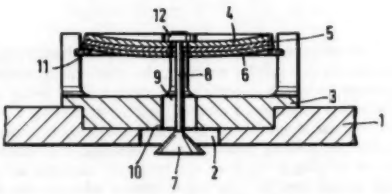
Werner Föller, Stuhr, Fed. Rep. of Germany, assignor to GESTRA Kondensatableiter GmbH & Co., Bremen, Fed. Rep. of Germany

Filed Apr. 10, 1984, Ser. No. 598,781

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1983, 3313888

Int. Cl.[4] F16T *1/08*

U.S. Cl. 236—59 **9 Claims**



1. In a steam trap having a closure valve disposed on the low pressure side cooperating with a valve seat, said valve being normally open at lower operating temperatures, a valve stem for said valve, a control unit disposed in the high pressure side of said steam trap acting on said valve stem to close said valve at elevated temperatures, said control unit including a plurality of bimetallic spring elements each having a support portion and an operative portion and different actuation temperatures, support means for supporting the support portions of said bimetallic spring elements in a stationary manner with respect to said steam trap, and means for engaging the operative portions of said bimetallic spring elements with the valve stem of said closure valve so that in a first partial range within the

operating range of the steam trap, only one of the bimetallic spring elements is activated to exert a closing force on said closure valve, while in other partial ranges within the operating range of the steam trap at least another bimetallic spring element is activated to exert a closing force on said closure valve in addition to the closure force exerted by said bimetallic spring element activated in said first partial range, the improvement comprising:

(a) said bimetallic spring elements being bimetallic snap elements having mutually different snap temperatures which overlie one another in abutting relationship in the cold state;

(b) said support means for supporting the support portions of said bimetallic snap elements includes a single support element fixed with respect to said steam trap; and

(c) said means for engaging the operative portions of said bimetallic snap elements with the valve stem of said closure valve includes a single support on the valve stem of said closure valve;

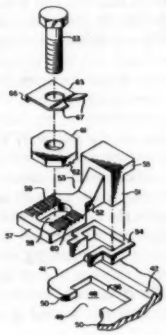
said support element for the support portions of said bimetallic snap elements and said support for the operative portions of said bimetallic snap elements being so disposed with respect to one another that the closure valve closes on said valve seat within the closure stroke of each bimetallic snap element at the latest at the maximum of the spring force isotherms of the bimetallic snap elements.

4,561,589

RAIL FASTENING ASSEMBLY

Richard M. Hixson, 4140 Thunderbird Dr., Marietta, Ga. 30067

Filed May 24, 1983, Ser. No. 497,606
Int. Cl.[4] E01B *9/42, 9/48*
U.S. Cl. 238—297 **10 Claims**



1. A rail fastening assembly for holding a steel transportation rail to a tie structure, said assembly comprising:

(a) a generally rectangular, steel base plate designed to lie between the rail and the tie structure in a substantially perpendicular direction to the rail, said plate having a vertical hole therethrough near each end of the plate, said hole being designed to receive a flange-headed hook member and being connected via a narrower throat-like opening in the plate to the edge of the adjacent end of the plate;

(b) means for releasably holding the rail to the base plate in a fixed position intermediate the ends of the plate; and

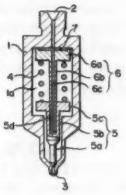
(c) a pair of anchoring devices, one for each end of the base plate, each said device being comprised of (i) a steel base member having a first end that is designed to be positioned nearest to the rail, a second end that is opposite the first end and is designed to extend at least to the adjacent end of the base plate, and a middle section joining the first and second ends, the outline of the first end and middle section being substantially the same configuration, but slightly smaller, as the hole and throat-like opening in the steel base plate, respectively, so that said first end of the base member can be lowered into said hole in the base plate in interlocking engagement therewith; (ii) said flange-headed hook member projecting upwardly from, and being integral with, the first end of the base member, the flanged head of said hook member being designed to overlap part of the base plate adjacent said hole; and (iii) means associated with the second end of the base member for fastening said base member to the tie structure, thereby restraining the base plate from lateral and vertical movement with respect to the tie structure.

4,561,590

FUEL INJECTION NOZZLE ASSEMBLY

Jiro Akagi, Oyama, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Dec. 28, 1982, Ser. No. 453,995
Claims priority, application Japan, Dec. 28, 1981, 56-209922
Int. Cl.[4] F02M *41/16*
U.S. Cl. 239—96 **3 Claims**



1. A fuel injection nozzle assembly for the injection of fuel under pressure from a fuel injection pump into a combustion chamber of an internal combustion engine, comprising:

a nozzle body having formed therein a storage chamber for receiving incoming pressurized fuel and a spray orifice for discharging in the form of droplets said pressurized fuel from said storage chamber;

a needle valve within said storage chamber for closing and opening said spray orifice, said needle valve having a small diameter portion positioned at said spray orifice and adapted to close and open said spray orifice, a central large diameter portion and a spring retainer portion, and having a blind hole formed in said spring retainer portion and said large diameter portion and opening to said storage chamber;

a check valve including a large diameter cylindrical section formed with a recess at one end to define a fuel inlet chamber, a stem portion extending from the other end of said cylindrical section, and an axial passage extending through said cylindrical section and said stem portion, said check valve being positioned in said storage chamber with said stem portion slidably mounted in said blind hole of said needle valve, whereby said axial passage connects said fuel inlet chamber with the interior of said blind hole;

a spring positioned in said storage chamber between said spring retainer portion of said needle valve and said cylindrical section of said check valve and adapted to bias said needle valve to close said spray orifice and to bias said check valve recessed cylindrical portion against a wall of said body to form said fuel inlet chamber; and

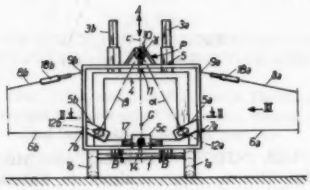
a fuel inlet port in said wall of said body in communication with said fuel inlet chamber and adapted to be connected to said fuel injection pump to allow introduction of pressurized fuel into said storage chamber via said inlet chamber and said check valve against the bias of said spring.

4,561,591

MOBILE APPARATUS FOR SPRAYING A LIQUID FOR THE TREATMENT OF PLANTS

Patrick J. M. Ballu, Reims, France, assignor to Tecnoma, Epernay, France

Filed Jan. 26, 1983, Ser. No. 461,218
Claims priority, application France, Jan. 29, 1982, 82 01418
Int. Cl.[4] A01M *7/00, 21/00;* **B05B** *9/06, 15/06*
U.S. Cl. 239—159 **9 Claims**



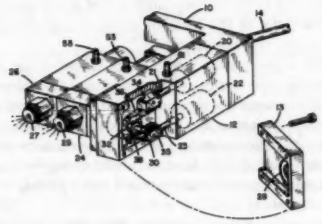
1. Mobile apparatus for spraying a liquid for the treatment of plants, comprising a support element, fixed to a tractor vehicle of trailer vehicle, at least one spray-distributor with a frame element suspended by a socket-and ball bearing from the said support element, rollers mounted loose on parts of one of the said elements, rolling surfaces arranged on the other element in a substantially parallel relationship to said parts of said one element, and means for returning the said rollers into contact with the said rolling surfaces.

4,561,592

ROBOT SPRAY HEAD

Norman N. Fender, Monroe, Mich., and Mark S. Davis, Schaumburg, Ill., assignors to Graco Robotics, Inc., Livonia, Mich.

Filed Mar. 22, 1984, Ser. No. 592,080
Int. Cl.[4] B05B *15/08*
U.S. Cl. 239—587 **13 Claims**



1. A rotatable spray valve assembly adapted for attachment to a mechanical robot or the like, comprising

(a) a housing adapted for attachment to said robot;

(b) a pair of linearly actuable members in said housing arranged in approximate parallel alignment, each of said actuable members having an actuating rod extending therefrom;

(c) a rack gear attached to each of said actuating rods;

(d) a pinion gear and shaft positioned intermediate said rack gears, said pinion gear engageable by either of said rack gears to cause rotation of said shaft;

(e) at least one spray nozzle attched to said shaft for rotation therewith; and

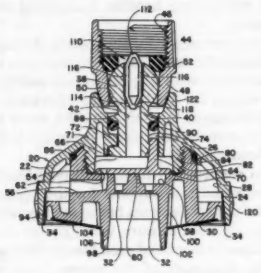
(f) an axial bore extending at least partially through said shaft, said bore being in fluid flow communication with said spray nozzles, and said shaft having a further opening therethrough to said bore, said opening being in fluid flow communication with a source of pressurized fluid.

4,561,593

SHOWERHEAD

Michael A. Cammack, and David W. Smith, both of Ft. Collins, Colo., assignors to Teledyne Industries, Inc., Fort Collins, Colo.

Filed Jan. 19, 1983, Ser. No. 459,137
Int. Cl.[4] B05B *1/16*
U.S. Cl. 239—600 **8 Claims**



1. A showerhead comprising:

a generally hollow housing having front and rear openings leading to the interior of said housing;

a closure affixed within said front opening and defining outlets for directing liquid in a selected spray pattern outwardly from said interior;

a pivot assembly including a ball in the form of a generally spherical segment and joined to a shank which projects away from said ball and is slidably received through said rear opening in protrusion toward said front opening, a conduit being defined through said ball and said shank to deliver liquid into said interior;

a nut having means for connection to a delivery pipe and a snout enveloping said ball, the internal wall of said snout tapering inwardly to captivate said ball when the latter is urged outwardly relatively to said snout;

means for urging said ball outwardly relative to said snout when said connection means is attached to said pipe and for effecting a seal for said liquid;

means within the interior of said housing for captivating said shank against withdrawal from said rear opening, said captivating means seating said shank within said housing, permitting rotation of said housing around said shank;

means defined in said housing including said closure for creating first and second groups of flow outlets for said liquid;

first and second channels defined in said closure for enabling the flow of said liquid individually to respective different ones of said groups;

and a flow director secured to said shank for selecting the path of flow of said liquid as between said first and second channels as said housing is rotated around said shank.

4,561,594

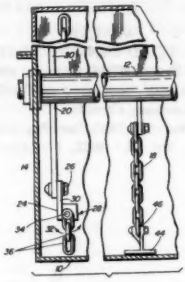
END CLEANER FOR FLAIL TYPE MANURE SPREADER

Lester R. Kampman, Vinton, Iowa, assignor to Highway Equipment Company, Cedar Rapids, Iowa

Filed Apr. 25, 1984, Ser. No. 603,644
Int. Cl.[4] A01C *3/06*
U.S. Cl. 239—658 **1 Claim**

1. A flail type manure spreader comprising a half round elongated tank having end walls, a rotor extending the length of said tank and journaled in said end walls, a series of flail chains mounted on said rotor in longitudinally spaced relation, a pair of elongated starter plates fixed to said rotor adjacent said end walls and flanking said flail chains, and elongated flinger plate pivotally secured to a free end of each said starter

plate, each flinger plate being provided with an inner face, a small plate anchored to said inner face at right angles thereto, and chain means mounted on said small plate whereby said flinger plates are adapted to rotate 360° above the pivotal



mounting thereof on said starter plates and in a plane perpendicular to the rotor length while said chain means is adapted to swing in an arc parallel to the length of said rotor and thereby move material into the path of the flail chains.

4,561,595

DEVICE FOR SPREADING GRANULAR AND/OR POWDERY MATERIAL

Ary van der Lely, Maasland, and Cornelis J. G. Bom, Rozenburg, both of Netherlands, assignors to C. van der Lely N.V., Maasland, Netherlands

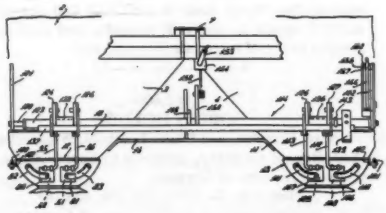
PCT No. PCT/NL83/00009, § 371 Date Apr. 28, 1983, § 102(e) Date Apr. 28, 1983

PCT Filed Mar. 8, 1983, Ser. No. 495,338

Claims priority, application Netherlands, Mar. 9, 1982, 8200958

Int. Cl.⁴ A01C *17/00*

U.S. Cl. 239—687 **6 Claims**



1. A device for spreading granular and/or powdery material comprising a hopper having at least two outlet ports, a rotatable distribution member arranged under said ports for receiving said material therefrom, each said port having a dosing slide for selectively closing it to a greater or lesser extent, said dosing slides being movable independently of each other by an adjusting mechanism comprising a control member, a coupling mechanism being provided which is operable selectively to connect and disconnect one or both said dosing slides to and from said control member so that one of said slides can remain in a predetermined position while the other said slide is displaceable by said adjusting mechanism, said adjusting mechanism comprising a coupling member on which coupling arms connected with said dosing slides are rotatably mounted, each said coupling arm extending to a position adjacent said coupling mechanism which is adjustable with respect to said coupling member and which together with said coupling member is rotatable about the centerline of said coupling member, said coupling mechanism being operable selectively to connect said coupling arms through said coupling mechanism rotationally with said coupling member to turn about said centerline, said coupling mechanism comprising a control rod extending parallel to said coupling member, said control rod being provided with slots which can be moved into and out of alignment with said coupling arms to connect and disconnect said coupling arms to and from said coupling member.

4,561,596

APPARATUS FOR SPREADING GRANULAR MATERIAL

Olle L. Siwersson, Helsingborg; Arne E. Wall, Landskrona, and Kent B. G. Kristensson, Helsingborg, all of Sweden, assignors to AB Scaniainventor, Helsingborg, Sweden

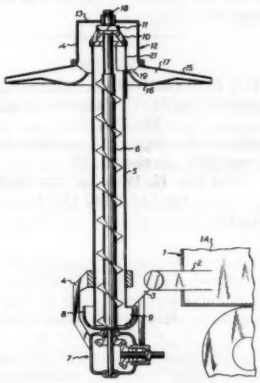
PCT No. PCT/SE82/00289, § 371 Date May 17, 1983, § 102(e) Date May 17, 1983, PCT Pub. No. WO83/00979, PCT Pub. Date Mar. 31, 1983

PCT Filed Sep. 22, 1982, Ser. No. 499,755

Claims priority, application Sweden, Sep. 23, 1981, 8105604

Int. Cl.⁴ E01C *19/20*; A01C *17/00*

U.S. Cl. 239—687 **8 Claims**



1. An apparatus for spreading granular material, such as fertilizer, said apparatus comprising a carriage which is adapted to be moved across a field and on which there is mounted a vertical conveyer (5,6) comprising a vertical cylindrical housing (5) and a conveyer screw (6) disposed therein, said vertical conveyer being adapted to convey material from a lower material space (3) to an upper material spreader (12) via a distributor (21), said cylindrical housing (5) being non-rotatably mounted on the carriage, and the conveyer screw (6) being rigidly connected at its upper end to the spreader (12), said screw being rigidly connected at its lower end to a rotary cup-shaped member (8) of a material infeed device (8,9) to the vertical conveyer (5,6), such that the rotary part (8) of the infeed device (8,9), the screw (6) and the spreader (12) are rotated together, said distributor (21) being adapted to control the flow of granular material from the vertical conveyer (5,6) to the rotary spreader (12) in such a way that the granular material will be approximately uniformly distributed within the contemplated spreading area after the carriage (1), said distributor (21) being a distributor disk (21) which is mounted over a discharge opening (20) provided in the cylindrical housing (5) and being of limited extent in the circumferential direction of the cylindrical housing, and which has a plurality of throughflow openings (23–25, 26–30), the effective throughflow area of said discharge openings, as calculated per angular unit in the circumferential direction of the cylindrical housing, varying in the widths of the openings and being smaller in width adjacent the sides of the discharge opening (20) of the cylindrical housing.

4,561,597

METHOD FOR IMPROVING HANDLEABILITY OF CALCINED KAOLIN CLAY PRODUCTS

Jerry A. Cook, Tennille; Robert H. Garner, Sandersville; Ralph E. Turner, Jr., and Bomi M. Bilimoria, both of Tennille, all of Ga., assignors to Anglo-American Clays Corp., Atlanta, Ga.

Continuation of Ser. No. 390,855, Jun. 22, 1982, abandoned, and a continuation-in-part of Ser. No. 341,918, Jan. 21, 1982. This application Oct. 15, 1984, Ser. No. 661,266

Int. Cl.⁴ B02C *17/04, 19/12*

U.S. Cl. 241—17 **8 Claims**

1. A method of preparing a calcined kaolin clay powder having increased bulk density and decreased wet-out time comprising:

(a) heating a kaolin clay powder of fine particle size to at least 400° C. to render same at least substantially anhydrous;

(b) dry ball-milling said anydrous clay powder using a work input in the range of from about 5 to about 40 HP-hrs/ton of dry clay; and then

(c) pulverizing said ball-milled clay powder in a high energy impact mill and classifying the same to eliminate undesirable larger particles.

4,561,598

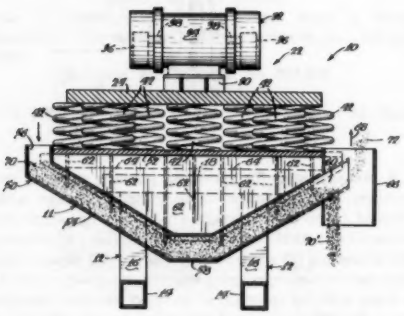
APPARATUS FOR GRINDING, MILLING, CRUSHING, SCRUBBING, SIZING AND/OR CLASSIFYING MATERIAL

Albert Musschoot, Barrington, Ill., assignor to General Kinematics Corporation, Barrington, Ill.

Filed Dec. 12, 1983, Ser. No. 560,858

Int. Cl.⁴ B02C *17/14*

U.S. Cl. 241—19 **10 Claims**



1. An apparatus for crushing, grinding or milling material, comprising:

a resiliently supported driving mass;

a working mass resiliently suspended from the driving mass;

tube means mounted on said working mass and forming a part of said working mass, said tube means moving with said working mass, having inlet and outlet ends, an intermediate portion, a downwardly sloping portion communicating between the inlet and intermediate portion, and an upwardly sloping portion communicating between the intermediate portion and the outlet,

said tube means having substantially a uniform cross-section and enclosed between the inlet and outlet ends;

vibration generating means forming part of said driving mass whereby a batch of granular material fed into the inlet end of said tube means is fluidized by said vibration generating means for crushing, grinding or milling the material within the tube means;

a stack carried at the outlet end of the tube means; and

means for creating a countercurrent air flow through the stack,

whereby the material introduced at the inlet traverses the downwardly sloping, intermediate and upwardly sloping portions of the tube means and, as the crushed, ground or milled material exits the outlet end of the tube means, minute particles in the material are drawn clear from the remaining exiting material by the countercurrent air flow.

4,561,599

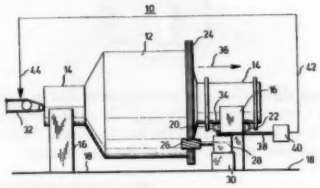
MILL LOAD SENSING SYSTEM

Marvin B. Shaver, Beaconsfield, Canada, and Rhual L. Guerguerian, Marietta, Ga., assignors to Dominion Engineering Works Limited, Lachine, Canada

Filed Nov. 16, 1983, Ser. No. 552,401

Int. Cl.⁴ B02L *17/24*

U.S. Cl. 241—34 **7 Claims**



1. A mill load sensing system for sensing the charge load in a mill rotating about an axis, said system comprising:

helical gear means operable with a rotatable drum of said mill and being driven by a pinion of a prime mover of said mill, said helical gear means during mill operation developing axial thrust forces;

the values of which are substantially a function of the charge load in the mill, said axial thrust forces being substantially parallel to said axis; and

at least one sensing means located in a region of said mill in a position to sense forces representative of said thrust forces, said sensing means providing output signals representative of the values of said thrust forces; and load control means responsive to said output signals for determining the charge load in said mill and for providing control signals to said mill whereby said control signals control entry of materials into said mill.

4,561,600

BOBBIN HOLDER

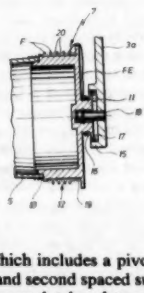
Aloys Greive, Kempten, and Dieter Leuthold, Wiggensbach, both of Fed. Rep. of Germany, assignors to Saurer-Allma GmbH, Kempten, Fed. Rep. of Germany

Filed Sep. 26, 1984, Ser. No. 655,189

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1983, 8328512[U]

Int. Cl.⁴ B65H *54/02, 54/553*

U.S. Cl. 242—18 DD **9 Claims**



1. In a bobbin holder which includes a pivotally supported bobbin frame having first and second spaced support arms and which includes first and second tube plate members respectively freely rotatably supported on said first and second sup-

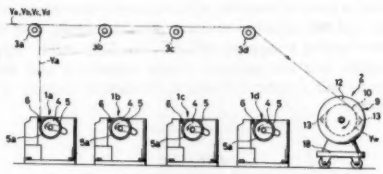
port arms of said bobbin frame, wherein said first plate member has a centering projection for supporting a bobbin tube, has thread catch means axially adjacent said centering projection, and has an annular mounting projection which is disposed concentrically around a mounting spindle portion of and projects toward said first support arm and which is concentrically encircled over a part of its axial length by a sleeve-like portion provided on said first support arm, the improvement comprising wherein said mounting projection, in a region thereof spaced axially from said sleeve-like portion, is provided with a peripheral groove into which can be wound an overhanging free end of thread which is free of engagement with said thread catch means.

4,561,601

WINDING METHOD AND APPARATUS FOR MULTIFILAMENT FIBER BUNDLE

Yoshumi Arita; Kosuke Katsuki, and Sadao Tabuchi, all of Ehime, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Feb. 28, 1984, Ser. No. 584,359
Claims priority, application Japan, Mar. 2, 1983, 58-32943
Int. Cl.⁴ B65H *54/02*
U.S. Cl. 242—35.5 R **5 Claims**



1. Apparatus for winding a plurality of multifilament fibers on a plurality of bobbins comprising:

a plurality of winders disposed in a row and fixed at predetermined intervals;

each of said winders having a motor driven spindle, the axes of said spindles being parallel to each other, and having a bobbin installed on each spindle;

a plurality of guide rollers for carrying said fibers moving lengthwise down said row, one of said guide rollers being positioned adjacent to each of said winders so that each fiber passing lengthwise along said row of winders may bend around one of said guide rollers to extend in the direction of one of said winders to be wound thereon; and

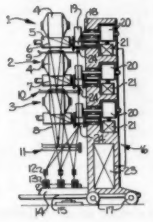
a common waste yarn winder provided independently of said winders and positioned at the downstream end of said row of winders in the direction of movement of said fibers, said fibers to be wound on said winders each passing over one of said guide rollers and initially extending the full length of said row to be attached to said waste yarn winder to be wound on said waste yarn winder, whereby each of said fibers may be individually sequentially cut from said waste yarn winder and be attached to the bobbin of a respective winder adjacent to its initial path of movement for winding thereon.

4,561,602

METHOD AND APPARATUS FOR FACILITATING DOFFING OF A YARN PROCESSING MACHINE

Heinz Schippers, and Gerd Münnekehoff, both of Remscheid, Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Remscheid, Fed. Rep. of Germany

Filed Dec. 19, 1983, Ser. No. 563,024
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1982, 3247020; Jul. 27, 1983, 3326980; Sep. 9, 1983, 3332568
Int. Cl.⁴ B65H *54/20, 54/26, 67/04*
U.S. Cl. 242—35.5 A **22 Claims**



1. A method for continuously removing waste yarn during doffing of a textile yarn processing machine having a plurality of yarn winding stations aligned along at least one side thereof, and wherein the yarn continues to advance during the doffing operation, and comprising the steps of

moving a mobile carriage to a position adjacent a yarn winding station at the conclusion of the winding operation at such station,

transferring the advancing yarn from the winding station to a take-up spool mounted on said carriage, while rotating the take-up spool and so as to wind the yarn thereupon, and including severing the yarn between the winding station and take-up spool,

removing the full bobbin from the adjacent yarn winding station and replacing the same with an empty bobbin, then

transferring the advancing yarn from the take-up spool on said carriage to the empty bobbin and so as to wind the yarn thereupon, and including severing the yarn between the take-up spool and empty bobbin, and then

moving the mobile carriage to a position adjacent a different winding station and repeating the above steps.

4,561,603

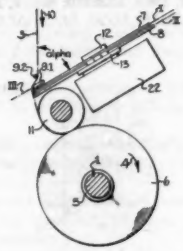
YARN TRAVERSE APPARATUS AND METHOD

Heinz Schippers; Erich Lenk, both of Remscheid; Herbert Schiminski, Hückeswagen, and Herbert Turk, Remscheid, all of Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik AG, Remscheid, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 566,583, Dec. 29, 1983, Pat. No. 4,505,436, and a continuation-in-part of Ser. No. 571,508, Jan. 17, 1984, Pat. No. 4,505,437. This application Jan. 25, 1985, Ser. No. 694,952
Claims priority, application European Pat. Off., Jan. 27, 1984, 84100848.5
Int. Cl.⁴ B65H *54/28*
U.S. Cl. 242—43 A **16 Claims**

1. In a yarn traverse apparatus for reciprocating a running yarn transversely to its running direction over a predetermined traverse stroke, and which includes at each of the ends of the traverse stroke a guide rail extending generally in the direction of the yarn traverse, a pair of guide arms mounted for rotation about closely adjacent parallel, or coaxial, axes and so that the rotating arms define closely adjacent parallel planes and the extremity of each rotating arm is adapted to pass through the yarn path of travel and along the guide rail, and means for rotating the arms in opposite directions so that one arm moves along the guide rail in a direction toward the end of the tra-

verse stroke, and the other arm moves along the guide rail in the opposite direction and from the end of the traverse stroke toward the center of the stroke, with the outer extremity of said one arm including a leading edge facing in the direction of its rotation and which is adapted to contact and move the running yarn toward the end of the traverse stroke where it is released from said leading edge, the improvement therein comprising means for guiding the yarn adjacent each of the



ends of the traverse stroke so as to define a distinct short initial traverse distance from the end of the stroke toward the center of the stroke wherein the yarn is released from any positive guidance and is essentially free to move toward the center of the stroke, and a distinct second traverse distance which is adjacent said initial traverse distance wherein the yarn is restrained in such movement by applying a frictional force to the yarn counteracting such movement, whereby proper engagement of the yarn by the extremity of said other arm is assured.

4,561,604

SPINNING REEL

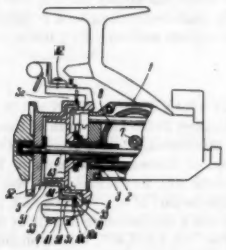
Shiro Matsushima, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Jul. 17, 1984, Ser. No. 631,758

Claims priority, application Japan, Jul. 18, 1983, 58-111290; Dec. 26, 1983, 58-203171

Int. Cl.[4] A01K *89/01*

U.S. Cl. 242—84.2 R **7 Claims**



1. A spinning reel, comprising a reel body, a rotary frame having a main frame and a pair of support arms connected to said main frame, said rotary frame being supported to said reel body, a spool having a trunk and an outer flange and an inner flange and supported to said reel body to be movable longitudinally thereof such that a fishing line is wound onto said spool through rotation of said rotary frame, a gap being formed between each support arm and said inner flange, and an intercepting mechanism having an intercepter for intercepting said line to prevent said line from entering through said gaps between said support arms and said inner flange at said spool to an extent to reach root sides of said support arms at which said support arms are connected to said main frame, said intercepter being supported rotatably with respect to said spool and including engaging portions engageable with at least one said support arm to allow said intercepter to rotate together with said rotary frame.

4,561,605

BRAKE FOR A FISHING REEL

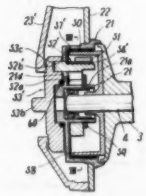
Hideki Nakajima, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Dec. 21, 1982, Ser. No. 451,835

Claims priority, application Japan, Dec. 25, 1981, 56-195139[U]; Dec. 29, 1981, 56-197683[U]; Oct. 14, 1982, 57-155863[U]

Int. Cl.[4] A01K *89/02*

U.S. Cl. 242—84.52 B **2 Claims**



1. A fishing reel comprising a spool and a magnetic brake for reducing an overrun of said spool, said reel being provided with a frame member which rotatably supports said spool, a cylindrical electric conductor rotatable together with said spool, and a magnet holder having at least one magnet positioned at one side of said holder radially of said conductor and opposite thereto, said holder having a support means which supports said holder to said frame member so that said holder and said magnet are adjustable in position radially toward or away from said conductor to adjust a gap in a radial direction between said magnet and said conductor to thereby adjust the braking effect exerted on said conductor, said support means incuding a control member which controls movement of said holder and the adjusted position of said magnet, said frame member having a support cylinder which rotatably supports said spool, and said support means supporting said magnet holder to said support cylinder to be slidable radially of said conductor.

4,561,606

SEAT BELT RETRACTOR OF AUTOMOBILE

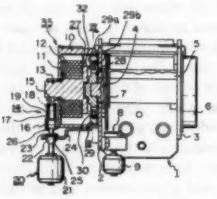
Kazuo Sakakibara, Toyokawa; Toshiaki Shimogawa; Masahiko Kato, both of Okazaki, and Fumio Matsuoka, Toyota, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Oct. 19, 1983, Ser. No. 543,458

Claims priority, application Japan, Oct. 21, 1982, 57-183679

Int. Cl.[4] A62B *35/02*; B65H *75/48*

U.S. Cl. 242—107 **3 Claims**



1. A seat belt retractor mounted on an automobile, comprising:

means for winding a seat belt, said winding means having a reel rotatably supported in a housing and urged in a direction to retract and wind the seat belt;

means for storing a rotating force, said storing means having a shaft rotatably supported in a casing, a resilient member urging said shaft only in a rotating direction, and a stopper normally preventing said shaft from rotating so that said shaft is held against said resilient member, said shaft storing a predetermined rotating force when stopped by means of said stopper;

means for sensing shock applied to the automobile body;

a trigger for releasing said stopper to allow said shaft to rotate when shock is sensed by said sensing means; and

a clutch for transmitting said rotating force of said shaft to said reel when said shaft rotates due to release by said trigger, said cultch comprising:

a gear rigidly fixed to said reel;

an annular guide provided at said housing and enclosing said gear, said guide being formed with a recess;

a flange formed at said shaft and provided with a notch; and

a connecting member continuously engaging said notch

when said shaft does not rotate, said connecting member also engaging said recess formed in said annular guide and being released from said gear so that said reel is detached from said shaft, and

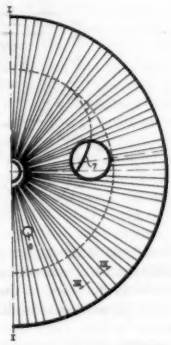
when said shaft rotates, said connecting member disengaging from said recess and engaging with said gear so that said reel is connected to said shaft.

4,561,607

CABLE DRUM

Ferenc Vágán, Kiskunfélegyháza, Hungary, assignor to Aprillis 4. Gepipari Muvek, Ungarn, Hungary

Filed May 5, 1983, Ser. No. 491,974
Int. Cl.⁴ B65H *75/14*
U.S. Cl. 242—118.4 **14 Claims**



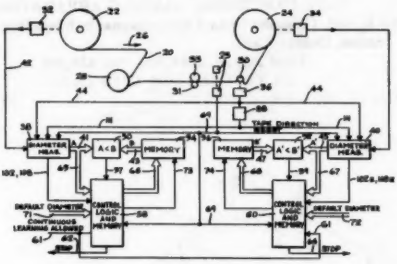
6. A foldable drum for cables, wires, or any other endless fibrous material comprising a cylindrical cable carrier secured at each end to a circular sidewall, said cylindrical cable carrier comprising a plurality of articulating coupled arm pairs arranged about the central axis to define a cylindrical body, said arm pairs being arranged in two annular rows parallel to said sidewalls, the arm pairs in one row being circumferentially offset from those in the other row and having their free inner ends pivotally connected in a first annular bearing axis parallel to said sidewalls, and having their free outer ends pivotally connected in a second annular bearing axis formed on each of said sidewalls, whereby when said hinged arm pairs are displaced radially, said arm pairs are folded in the symmetry plane running parallel with the sidewalls.

4,561,608

ADAPTIVE END OF TAPE DETECTION APPARATUS AND METHOD

David C. O'Gwynn, Colorado Springs, Colo., and Thomas L. Helmers, Millbrae, Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed Sep. 20, 1984, Ser. No. 653,752
Int. Cl.⁴ B65H *59/38*; G03B *1/04*; G11B *15/32*
U.S. Cl. 242—186 **34 Claims**



11. An apparatus for detecting end of tape on a reel in a magnetic tape recording or reproducing device wherein said tape is transported between a supply and takeup reel, comprising:

means for measuring a diameter of a tape pack on each said reel,

means for storing a tape pack diameter value on each said reel corresponding to an end of tape on said reel; and

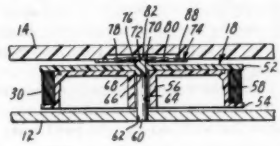
means for updating said stored diameter value when a measured diameter value is smaller than said stored value and when said apparatus is in a learning mode and for stopping said tape when said measured value is substantially equal to said stored value and when said apparatus is in an other than learning mode.

4,561,609

ANTI-FRICTION AND NON-OSCILLATING SPOOL FOR BELT DRIVEN CARTRIDGE

Leslie M. Collins, White Bear Lake, and Myron Zarr, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 29, 1984, Ser. No. 626,138
Int. Cl.⁴ G01B *1/04*; G11B *15/32*
U.S. Cl. 242—192 **9 Claims**



1. A tape spool in combination with a tape cartridge having two spaced, parallel walls and a cylindrical pin extending from one of said walls, said spool including two flanges interconnected by a hub providing a cylindrical tape winding surface, said spool further comprising:

a bore extending through said hub and one of said flanges and closely but freely fitting said pin;

a wear-button protrusion extending from the other of said flanges opposite and coaxial with said bore;

a bearing protrusion extending from said other of said flanges and into said bore; and

means for urging said bearing protrusion into contact with said pin;

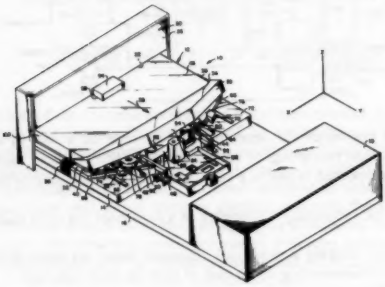
wherein the extension of said pin from said one of said walls is greater than the length of said bore to said bearing protrusion so that said spool is suspended above and may rotate free of contact with said one wall.

4,561,610

TAPE CARTRIDGE LOADING APPARATUS

Ko K. Gyi, Thousand Oaks, Calif., assignor to MegaTape Corporation, Duarte, Calif.

Filed Jul. 26, 1984, Ser. No. 634,564
Int. Cl.[4] G03B *1/04*; G11B *15/32*
U.S. Cl. 242—198 **22 Claims**



1. An arrangement for loading a tape cartridge in a deck comprising the combination of:

a deck;

a magnetic transducer assembly mounted on the deck; and

a tape cartridge loading assembly mounted on the deck and including as pawl adapted to engage a tape cartridge, means for moving the pawl toward the magnetic transducer assembly to enable the pawl to engage a tape cartridge and move the cartridge into an operative position adjacent the magnetic transducer assembly and means for moving the pawl away from the magnetic transducer assembly to permit removal of a tape cartridge from an operative position adjacent the magnetic transducer assembly, the pawl being disposed adjacent a surface of the deck, the means for moving the pawl toward the magnetic transducer assembly being operative to move the pawl outwardly from the surface of the deck in conjunction with moving the pawl toward the magnetic transducer assembly so as to bring the pawl into contact with a base of a tape cartridge and the means for moving the pawl away from the magnetic transducer assembly being operative to move the pawl toward the surface of the deck in conjunction with moving the pawl away from the magnetic transducer assembly to remove the pawl from contact with a base of a tape cartridge.

4,561,611

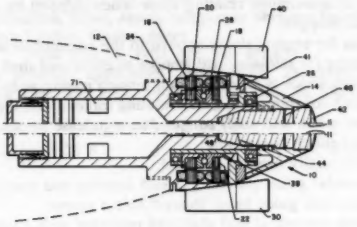
INFRARED TARGET SEEKER FOR SPINNING PROJECTILE

Ronald R. Sinclair, Moultonboro, N.H., and Theodore J. Nussdorfer, Lexington, Mass., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Aug. 10, 1973, Ser. No. 392,713
Int. Cl.[4] F41G *7/22*
U.S. Cl. 244—3.16 **6 Claims**

1. In combination with a spinning projectile, an infrared target seeker connected to the spinning projectile for rotation thereof, comprising:

a plurality of lenses;



a reticle etched on one of said lenses; and

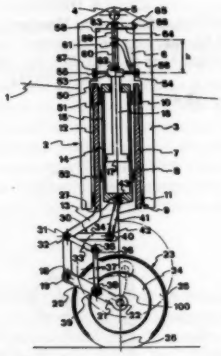
a photocell detector, said lenses, reticle and detector forming a solid unit having no air gaps between components.

4,561,612

WHEEL LEVER LANDING GEAR

Jean Masclet, Paris, France, assignor to Messier-Hispaono-Bugatti (S.A.), France

Filed Jun. 8, 1984, Ser. No. 618,863
Claims priority, application France, Jun. 8, 1983, 83 09469
Int. Cl.[4] B64C *25/58*
U.S. Cl. 244—104 R **3 Claims**



1. A nose wheel type landing gear for aircraft, comprising:

a shock absorber which is essentially constituted by cylinder and a rod slidably mounted in the said cylinder;

a sleeve at least partially surrounding the said shock absorber;

bearings for guiding the said cylinder in translation relative to the said sleeve, the said sleeve including a bracket projecting a certain distance past the shock absorber in its lowest position;

at least one running means comprising at least one wheel;

a wheel lever having one end pivotally mounted about a first axis to the end of the said projecting bracket, and the other end including a second axis about which the said wheel is rotatably mounted;

a two-arm yoke pivotally mounted about a third axis substantially at its base, a first one of the two arms being situated in a plane to one side of the said wheel, and the second one of the two arms being situated substantially in the plane of the wheel;

a link rod rotatably mounted at both ends, one end to the said wheel lever and the other end on the said first arm; and

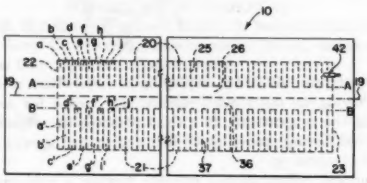
a connecting rod rotatably mounted at both ends interconnecting the second arm to the bottom end of the said shock absorber cylinder.

4,561,613

DEICER FOR AIRCRAFT

Norbert A. Weisend, Jr., Cuyahoga Falls, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed May 9, 1983, Ser. No. 493,082
The portion of the term of this patent subsequent to Jan. 22, 2002, has been disclaimed.
Int. Cl.[4] B64D *15/18*
U.S. Cl. 244—134 A **6 Claims**



1. A pneumatic deicer pad for a wing of an aircraft having a leading edge, an inboard end and an outboard end; said pad having an intermediate portion with a centerline overlying said leading edge and also having a pair of spaced apart portions located rearward of said centerline when positioned on said wing to provide a pair of rearwardly disposed edges; said centerline of said deicer pad coincides with said leading edge of said wing; said spaced apart portions defining an upper portion and a lower portion; said deicer pad having an inner ply for attachment to said wing; an outer extensible elastic ply overlying said inner ply, said plies being stitched on said intermediate portion to define at least a pair of spanwise passageways; said plies being stitched together at said respective rearwardly disposed spaced apart portions to define two groups of passageways, with each group having a plurality of adjacent chordwise extending passageways in side by side relationship that all terminate adjacent one of said spanwise passageways; one of said groups of passageways located in said upper portion and the other of said groups of passageways located in said lower portion; certain ones of said chordwise passageways in each group communicate directly with adjacent ones of said spanwise passageways; the remaining ones of said chordwise passageways in each group communicate with said spanwise passageways around said stitching with the adjacent ends of said spanwise passageways; said certain ones of said chordwise passageways in each group also communicate with adjacent ones of said remaining ones of said chordwise passageways around adjacent stitching; means for communicating said passageways with a pressure source which is operative upon pressurization to elastically distend the portions of said outer ply by inflating said passageways; and all of said plies being covered with an air impervious layer to retain pressurized air within said deicer pad.

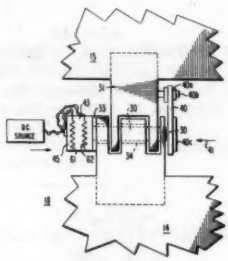
4,561,614

DEPLOYABLE FOLDED MULTI-ELEMENT SATELLITE SUBSYSTEMS

Philip Olikara, Plainsboro, and Derek S. Binge, Hamilton Square, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Dec. 7, 1982, Ser. No. 447,695
Int. Cl.[4] B64G *1/44, 1/22*
U.S. Cl. 244—173 **2 Claims**

1. A method of deploying a satellite subsystem deployable from a folded position against a main spacecraft body to an extended position generally in a plane perpendicular to said body in a manner so as not to damage the subsystem and to minimize disturbance torques to the satellite when being deployed, said subsystem comprising a set of structural elements, said set of elements joined end to end and to one surface of said body by hinge means between each of said elements and bias hinge means between one of said elements closest to said body and said body, each of said hinge means including a viscous fluid damper for damping the rate of deployment of said elements, said method comprising the steps of;



testing the deployment of the elements before launch with all of said dampers heated at a predetermined temperature which at a minimum will be the maximum temperature any hinge damper will sense when the satellite is in its deployment position,

after the satellite is in orbit heating all of the hinge dampers to said predetermined temperature, and

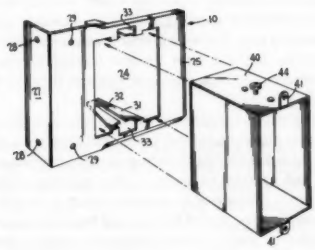
once all dampers are heated to said predetermined temperature deploying said structural elements.

4,561,615

MOUNTING BRACKET FOR A JUNCTION BOX

Lewis B. Medlin, Jr., P.O. Box 237, Blue Ridge, Va. 24064

Filed Oct. 11, 1983, Ser. No. 540,384
Int. Cl.[4] G12B *9/08*; H02G *3/11*
U.S. Cl. 248—27.1 **4 Claims**



1. A one-piece mounting bracket for a junction box comprising:

a laterally extending flat plate member having a cutout section removed therefrom;

a flange integral with said plate member and substantially orthogonally connected to one side of the plate member;

at least one ear integral with said plate member and projecting through said cutout section with both the ear and the flange being perpendicular to the plane of the plate member;

said ear having inner and other ends with a slot extending axially along said ear and being closed off at the outer end and open at the inner end of the ear;

an insert opening positioned in said plate member at said

cutout section and being in open communication with the slot at the inner end of the ear;

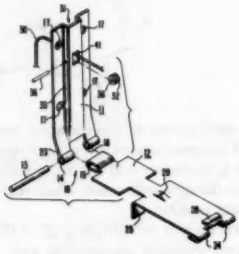
whereby a junction box having a positioning screw may be readily inserted through said cutout section with the positioning screw engaging the slot to retain the junction box relative to the mounting bracket.

4,561,616

BRACKET ASSEMBLY FOR INVERTING GUTTER TO DUMP ACCUMULATED DEBRIS

Genevieve T. Robinson, 499 Millbrook Rd., Devon, Pa. 19333

Filed Jun. 27, 1984, Ser. No. 625,854
Int. Cl.⁴ E04D *13/06*
U.S. Cl. 248—48.2 **3 Claims**



1. A bracket assembly for attachment to a building wall for mounting a standard open top gutter thereon in a movable position for selective manual pivoting away from a positive latched position for receiving water from the building roof to allow the gutter to be inverted and directed away from the wall for dumping accumulated debris away from the wall, comprising in combination,

a first bracket member for fixed attachment to a building having a vertical gutter mounting wall for mounting the gutter in place for receiving water from the building roof,

a second bracket member vertically movable alongside and pivotally attached to said first bracket member for relative rotation thereon over an arc having thereon retaining structure to lock in place and support thereon the gutter to pivot therewith,

pivoting means connecting the two brackets pivotably about an axis closely adjacent to the building wall allowing the two bracket members to be maintained substantially parallel and closely adjacent to the building wall when the gutter is positioned to receive water from the roof while permitting the gutter and second bracket member to move vertically and to pivot through an arc of less than 180 degrees with the gutter reaching a limiting position in contact with the building wall and directed outwardly to direct accumulated debris away from the wall, and

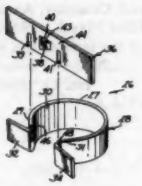
said first and second bracket members defining respectively thereon manually actuable interacting hook and latch members for engagement and disengagement upon vertical movement of the second bracket, said members maintaining the gutter locked in place in a water receiving position with said first and second bracket members parallel to and adjacent to the building wall in a latched position and for releasing said second bracket member from said first bracket member by means of vertical movement of the second bracket member to permit pivoting of the gutter downward about said arc to invert the gutter open top to said direction directed away from the wall for dumping accumulated debris therefrom.

4,561,617

SUPPORT DEVICE FOR DISPLAYING OBJECTS

William E. Hafner, Richfield, Minn.

Filed Jul. 6, 1984, Ser. No. 628,497
Int. Cl.⁴ F16L *3/00*
U.S. Cl. 248—121 **18 Claims**



1. A support device for displaying an object from a support pole having an outer wall surface and means for securely holding the support pole in a fixed position, the object to be displayed having spaced apart first and second apertures, the device comprising:

a support pole-engaging member having a pole-engaging section with an inner surface such that the inner surface conforms to the outer wall surface of the support pole is adapted to and frictionally engage at least a portion of the outer wall surface and further having first and second leg portions with each leg portion having an outwardly extending tab portion;

a connecting member having first and second slots for insertably engaging the first and second leg portions, respectively, proximate the tab portions to secure the support pole-engaging member in frictional engagement with the support pole, and having means for attaching the object to be displayed; and

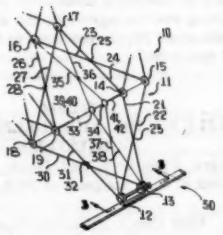
a first wire member having a hook portion attachably engaging the means for attaching and having first and second outwardly extending diverging arm portions for attachment to the object wherein the wire member is made from spring-type wire and wherein the first and second outwardly extending arm portions of the wire member extend in an angular upward direction and the first and second spaced apart apertures are adapted for receiving distal end portions of the wire member.

4,561,618

STABILIZING FOOT FOR AN EXHIBIT FRAME

Theodore R. Zeigler, 9923 Indian Queen Point Rd., Oxon Hill, Md. 20022

Filed Nov. 17, 1983, Ser. No. 552,720
Int. Cl.⁴ F16M *11/38*
U.S. Cl. 248—166 **9 Claims**



1. An exhibit stand comprising a plurality of generally polygonal frames constructed from a plurality of interconnected relatively movable rods, each frame being foldable from a collapsed inoperative condition to an erected operative condi-

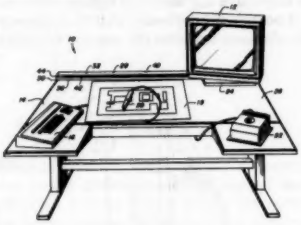
tion in generally spaced upstanding adjacent relationship to each other, said exhibit stand including at least two pair of aligned rings pivotally connected to rods along a bottom edge of said exhibit stand, each pair of aligned rings defining a pair of spaced aligned openings, an elongated base disposed in underlying transverse relationship adjacent each pair of openings, each said elongated base having a pair of ears disposed in upstanding spaced relationship thereto, each of said ears having an opening, means for connecting a pair of ear openings to a pair of ring openings, and said connecting means being a pin fastened through the openings of associated pairs of rings and ears.

4,561,619

MOVABLE CRT PEDESTAL

David R. Robillard, Westboro; Robert J. Bullock, Chelmsford, and Jerry C. Marino, Sudbury, all of Mass., assignors to Prime Computer, Inc., Natick, Mass.

Filed Feb. 10, 1984, Ser. No. 578,795
Int. Cl.⁴ E04G *3/00*
U.S. Cl. 248—285 **9 Claims**



1. A system for supporting and moving a CRT monitor on a horizontal surface comprising:
an extendable supporting means for supporting said monitor,
movement means arranged on said supporting means for providing movement of said supporting means on said horizontal surface, and
an elongate guide means mountable on said horizontal surface,
said supporting means being mounted on said elongate guide means for movement in a first direction parallel to said guide means,
said extendable supporting means being extendable in a second direction perpendicular to the first direction.

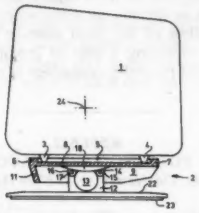
4,561,620

TILTABLE CATHODE RAY TUBE DISPLAY DEVICE STRUCTURE

Fred E. Goetz; Jim C. Harris, both of Boca Raton, and Steven E. Howell, Lantana, all of Fla., assignors to International Business Machines Corp., Armonk, N.Y.

Filed May 3, 1984, Ser. No. 604,683
Int. Cl.⁴ A47G *29/00*
U.S. Cl. 248—371 **4 Claims**

1. A tiltable cathode ray tube display device structure comprising:
(a) an assembly, including said display device, tiltable about a line passing through at near the center of gravity of the assembly, said assembly including a pair of spaced gear segment mounted to extend below the assembly, each segment having a radius of curvature centered on said line;
(b) a base number carrying two pairs of support pinions, each pair of support pinions being mounted to engage and support a corresponding one of said gear segments; and
(c) mounted on the base member, two idler pinions, each intercoupling the pinions of an associated pair of the support pinions and arranged to permit free rotation of the associated pair of support pinions during tilting movement of the assembly in response to tilting force applied to the assembly, and to apply static rest pressure to the associated pair of support pinions to resist tilting movement of the assembly when at rest.

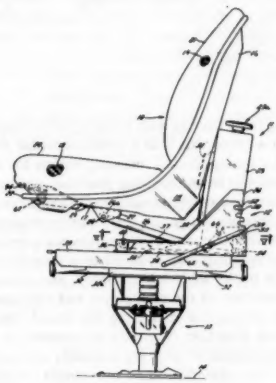


4,561,621

TILTABLE VEHICLE SEAT FOR BACKHOES OR THE LIKE

Kevin E. Hill, Milwaukee, Wis., assignor to Milsco Manufacturing Company, Milwaukee, Wis.

Filed Aug. 17, 1983, Ser. No. 523,783
Int. Cl.⁴ B60N *1/08*
U.S. Cl. 248—397 **8 Claims**



7. In an earth working vehicle such as a backhoe wherein an earth working bucket or the like is operative to form an excavation in the ground and at the rear end of the vehicle and the operator is positioned on a vehicle seat located adjacent said rear end of said vehicle whereby the operator must visually observe the excavation being done, a tiltable seat assembly adjacent said vehicle rear end and comprising: a seat support frame including an operator's seat secured to said frame, and also including resilient means in the form of vertically arranged springs located between said seat and said seat support frame for supporting said seat on said frame, pivot support means for pivotally connecting said tiltable seat assembly including said seat and said support frame about a transverse horizontal axis to said vehicle adjacent said rear end thereof to permit said support frame and its seat and resilient support means to tilt forwardly as a unit about said transverse horizontal axis and consequently tilt an operator forwardly in said seat for better visibility of the area being excavated; lock means acting between said seat and said unit in any one of a plurality of tilted positions; said lock means including a stationary lock member rigidly secured to said vehicle and having a pair of upwardly extending notched side walls having notches at the rear end

thereof, said unit having a releasable lock bar selectively engageable in said notches; seat rake adjustment means mounted on said seat for adjustment by said operator and for selectively changing the height of the front edge of said seat relative to the rest of said seat to thereby securely support said operator in said seat regardless of the tilted position thereof; said pivot support means including a pair of longitudinally extending spaced apart arms pivotally connected at one of their ends to said vehicle.

4,561,622

FOLDING TABLE CATCH

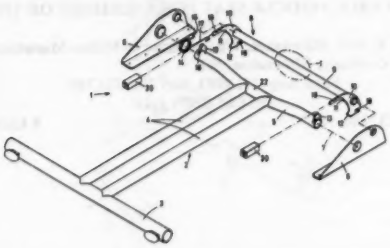
Eberhard Heinzel, Klosterweg 11, D-5789 Hallenberg, Fed. Rep. of Germany

Filed Aug. 4, 1983, Ser. No. 520,465

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1982, 3229210

Int. Cl.⁴ F16M *11/32*

U.S. Cl. 248—439 **6 Claims**



1. A folding table fitment with table leg assemblies which are pivotal about a pivot axis into a position under the table top member, and a spring-loaded retaining means for latching the table leg assemblies in an unfolded position, a connecting tube which is mounted pivotally parallel to the axis of pivotal movement of the table leg assembly, the retaining means including, at each end of said tube, a respective cam plate having latching surfaces for a latching cam secured to a round tube forming said pivot axis of the table leg assembly, and a torsion spring between at least one of the cam plates and the associated said latching cam, said spring encircling the round tube and being stressed in one direction of rotary movement in the folded position of the associated table leg assembly and being stressed in the other direction of rotary movement in the unfolded position of the table leg assembly and being unstressed in an intermediate position of the table leg assembly between said folded and unfolded positions.

4,561,623

BOOK HOLDER

Charles G. Shepherd, Oakville, and David Chapman, London, both of Canada, assignors to The Chas. Chapman Company Limited, London, Canada

Filed May 11, 1984, Ser. No. 809,370

Claims priority, application Canada, May 11, 1983, 427878

Int. Cl.⁴ B42D *3/06, 7/00*

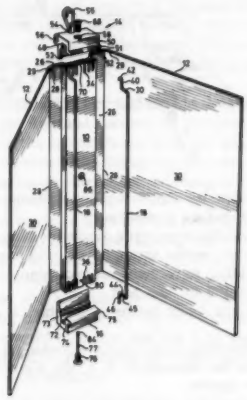
U.S. Cl. 248—447 **19 Claims**

12. A book holder comprising a generally elongate book spine of rectangular cross-section, said book spine having a front surface and a rear surface and top and bottom ends, said rear surface having a plurality of parallel channels provided in the rear surface of the book spine, said a plurality of parallel channels being arranged in two groups of equal numbers of channels symmetrically located on each side of a longitudinal centerline located midway across the surface of the book spine, each channel communicating at the top and bottom end of the book spine with a respective top and bottom slot extending through said book spine, each channel being generally U-shaped and are defined by wall means having at least one projection parallel to said channel,

a front book cover and a rear book cover, each of said front and rear covers having an integrally formed respective edge portion, each respective edge being slidably inserted in a respective channel, a respective rear cover portion integrally connected to each respective edge portion by a respective crease in said cover, a respective front and rear cover flap integrally connected to each respective rear cover portion by at least one living hinge, said at least one living hinge permitting each respective front and rear cover flap to be rotated between an open and a closed position,

said wall means and projection defining a width of the channel in the region of the projection narrower than a width of the edge portion to prevent the edge portion from being removed from the book spine other than by sliding movement parallel to the spine,

a pluraity of book retaining wires each having a top and bottom end extending between the respective top and bottom ends of the book spine, each book retaining wire top end having a hooked portion which is proportioned to fit in a respective top slot, said bottom wire end having a serrated portion proportioned to fit in a respective bottom slot, the distance between the top and bottom slots being



slightly greater than the distance between the hooked portion and the serrated portion of the wire,

top cap means detachably secured to the top of the book spine for securing said top ends of the book retaining wires and said front and rear covers to the book spine, said top cap means including an outwardly extending lip located on the front surface of the book spine and said outwardly extending lip having a plurality of lip slots each aligned with a respective said top slot, each lip slot having a slot opening tapering towards a base region of a smaller width than the wire, and

bottom cap means detachably secured to the bottom end of the book spine, said bottom cap means being loosenable from the bottom end of the book spine so that said book retaining wires can be pivoted about said top end so that said wires frictionally engage in a respective lip slot at said base region so that the wires are arranged substantially perpendicular to the book spine front surface and a book can be inserted into said book holder, and said serrated portions being frictionally engaged in said respective bottom slots which result in said respective wires being strained and caused to bend towards the front surface of the book spine, said bent wires being resilient so that when a book is positioned in the book holder the resilience and shape of the wires securely fastens the book to the book holder, and said top and bottom cap means being detach-

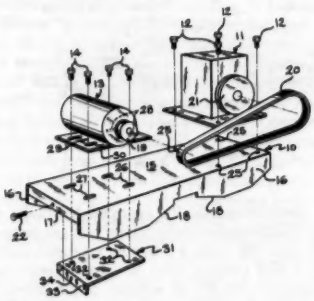
able and rotatable relative to the book spine whereby front and rear book covers can be removed and replaced in any of said plurality of channels without completely separating the top and bottom cap means from the book spine.

4,561,624

MOUNTING PLATFORM

Frederick O. Freeman, Toledo, Ohio, assignor to Champion Spark Plug Company, Toledo, Ohio

Filed Jun. 30, 1983, Ser. No. 509,894
Int. Cl.⁴ F16M *3/00*
U.S. Cl. 248—639 **3 Claims**



1. An improved platform for mounting a motor having an output sheave and a driven device having an input sheave connected through a drive belt to the motor output sheave, said platform having means for securely mounting said driven device and first and second pairs of spaced slots to which said motor is mounted, said slots extending in parallel to each other and to the plane of said drive belt, said motor having a base with first and second pairs of holes spaced to align respectively with said first and second pairs of spaced slots, four bolts passing through aligned motor base holes and mounting platform slots, said bolts, when tightened, securely connecting said motor to said mounting platform and, when loosened, allowing said motor to move toward and away from said drive device for adjusting tension on said belt, characterized by a first clearance between said bolts and said motor base holes, a second clearance between said bolts and sides of said mounting platform slots, spacing the slots in said first pair of slots transverse to the direction of movement of said motor and locating said second pair of slots further from said driven device then said first pair of slots, spacing the slots in said second pair of slots transverse to the direction of movement of said motor and spacing said second slots closer to the plane of said drive belt than said first slots by a distance equal to the sum of said first and second clearances.

4,561,625

MOLD STRUCTURE

William R. Weaver, Toledo, Ohio, assignor to Libbey-Owens-Ford Company, Toledo, Ohio

Continuation-in-part of Ser. No. 535,870, Sep. 26, 1983. This application Dec. 23, 1983, Ser. No. 564,721
Int. Cl.⁴ B29C *39/10, 45/26*
U.S. Cl. 249—85 **5 Claims**

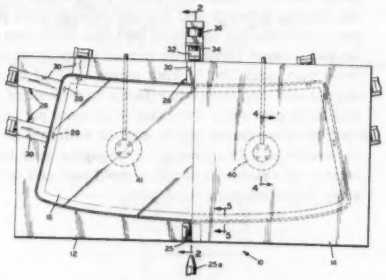
1. A mold structure for forming a gasket on a predetermined portion of a frangible sheet comprising:

at least two cooperating mold sections having facing surfaces defining a chamber for receiving the sheet;

seal means positioned in said mold sections adjacent the periphery of the sheet to resiliently support the sheet within the sheet receiving chamber and in spaced relationship with portions of the mold facing surfaces located interiorly of said seal means;

at least one of the facing surfaces of said mold sections located outwardly of the said seal means provided with a gasket shaping portion which cooperates with said seal means and the predetermined portion of the sheet to define a gasket forming cavity corresponding to the gasket to be formed on the sheet;

at least a portion of the facing surfaces of said mold sections disposed outwardly of the gasket forming cavity adapted to contact one another, said mold sections being constructed of a rigid material such that the contact between



the facing surfaces of said mold sections disposed outwardly of the gasket forming cavity limits the amount said seal means are compressed whereby the dimensions of the gasket forming cavity can be precisely controlled when said mold sections are in contacting relationship, said facing surfaces located inwardly of the contacting portions thereof delimiting said sheet receiving chamber; and

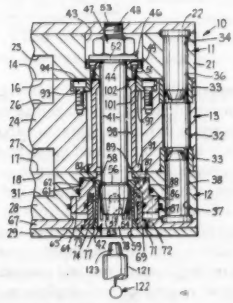
inlet means for introducing a flowable gasket forming material into the gasket forming cavity when said mold sections are in contacting relationship.

4,561,626

MOLD OPENING DEVICE

John W. Black, Hickory Corners, Mich., assignor to Pemco-Kalamazoo, Inc., Kalamazoo, Mich.

Filed Oct. 25, 1984, Ser. No. 664,818
Int. Cl.⁴ B29C *1/16;* B29F *1/022*
U.S. Cl. 249—118 **14 Claims**



1. A mold structure, comprising:

first, second and third mold parts stacked one on top of the other, each having first means thereon defining at least a part of a mold cavity, said second part being oriented between said first and third parts and having said first means on both sides thereof;

support means for supporting said first mold part for movement toward and away from said third mold part;

an elongate tie rod extending between said first and third mold parts and through an opening in said second mold part, said tie rod being supported on said first mold part by

first mounting means, said tie rod having first locking means thereon at a location spaced from said first mold part;

second locking means provided on said third mold part and cooperable with said first locking means on said tie rod for preventing lengthwise movement of said tie rod relative to said third mold part, said second locking means including second means defining an opening through said third mold part axially aligned with said tie rod;

stop means secured to said second mold part and positioned to operatively engage said first locking means for limiting the spacing between said first and second mold parts to a prescribed spacing so that as said first mold part and said tie rod secured thereto are moved away from said third mold part, said first locking means on said tie rod will engage said stop means to effect a movement of said second mold part away from said third mold part; and

extendible drive means axially aligned with said tie rod and receivable in said opening for engaging said tie rod to effect a movement of said first mold part and said tie rod away from said third mold part.

4,561,627

PILOT OPERATED FLUID CONTROL VALVE

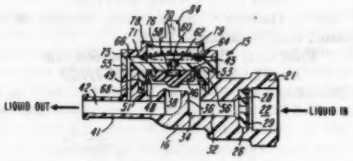
Alan F. Meckstroth, 2310 Far Hills Ave., Dayton, Ohio 45419

Continuation-in-part of Ser. No. 230,441, Feb. 2, 1981, Pat. No. 4,390,157, which is a continuation-in-part of Ser. No. 11,227, Feb. 12, 1979, Pat. No. 4,248,402. This application Jun. 24, 1983, Ser. No. 507,334

The portion of the term of this patent subsequent to Feb. 3, 1998, has been disclaimed.

Int. Cl.⁴ F16K *31/385, 31/40*

U.S. Cl. 251—11 **10 Claims**



1. A pilot operated liquid control valve comprising a valve body having means defining an inlet and an outlet with a valve seat therebetween, a flexible diaphragm valve member having an outer portion supported by said valve body and a movable inner portion cooperating with said seat to control the flow of liquid from said inlet to said outlet, means defining a bleed hole for directing a limited flow of liquid from an inlet chamber on one side of said diaphragm valve member to a second chamber on the other side of said valve member, means defining a vent passage for directing liquid from said second chamber around at least said inner portion of said diaphragm valve member to said outlet and providing for the release of liquid flowing through said bleed hole, a snap-acting control member disposed for controlling the flow of liquid through said vent passage and flexible between an open position permitting the flow of liquid through said vent passage into said second chamber and a closed position stopping the flow of liquid through said vent passage, means for sealing said control member to prevent the liquid within said second chamber from contacting an outer portion of said control member, and electrically operated means for flexing said control member to effect snap-acting movement between said closed and open positions.

4,561,628

ELECTROMAGNETICALLY OPERATED HYDRAULIC ACTUATOR

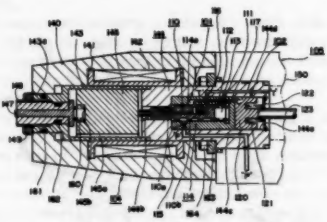
Yoshiaki Matsushima; Nobutaka Chiaki; Kuniaki Kato, all of Tokyo, and Toshihiko Horikiri, Funabashi, all of Japan, assignors to Tokyo Keiki Company Limited, Tokyo, Japan

Filed Aug. 28, 1984, Ser. No. 645,073

Claims priority, application Japan, Aug. 31, 1983, 58-133500[U]; Aug. 31, 1983, 58-133501[U]

Int. Cl.⁴ F16K *31/12*

U.S. Cl. 251—30.01 **5 Claims**



1. In an electromagnetically operated hydraulic actuator including an electromagnetically driven plunger means having a stationary magnetic core, a movable magnetic core and an excitor coil, a pilot control valve actuator by movement of a movable magnetic core, and an actuator piston driven by pilot hydraulic pressure controlled by the operation of the pilot control valve, the improvement wherein the stationary magnetic core includes a hollow chamber and both said pilot control valve and the actuator piston are disposed substantially completely within the hollow chamber of the stationary magnetic core; wherein said pilot control valve is directly mechanically driven by the movable magnetic core; and wherein the output hydraulic pressure of the pilot control valve is directly applied to the actuator piston.

4,561,629

SOLENOID VALVE

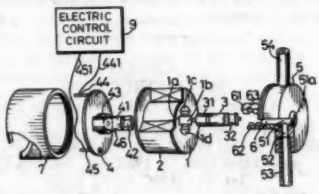
Takaharu Idogaki; Ikuo Hayashi, both of Okazaki; Hisasi Kawai, Toyohashi; Kyo Hattori, Susono, and Kazuhiro Sakurai, Gotenba, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Mar. 26, 1984, Ser. No. 593,309

Claims priority, application Japan, Mar. 28, 1983, 58-52224

Int. Cl.⁴ F16K *31/08*

U.S. Cl. 251—65 **10 Claims**



1. A solenoid valve for opening and closing a fluid passage, comprising:

(1) a case;

(2) a rod-like valve member supported rotatably within said case, said valve member having alternately different magnetic poles formed at equal intervals on the outer periphery of one end thereof and also having a fluid passage formed at the other end thereof;

(3) an electromagnetic drive means for creating alternately different and invertible magnetic poles in an opposed

relation to said magnetic poles of said valve member to rotate said valve member by a predetermined angle;

said electromagnetic drive means comprising a coil bobbin into which is inserted said one end of said valve member, an electromagnetic coil wound round said coil bobbin for generating a magnetic flux through the interior of said coil bobbin, an energizing means for energizing said electromagnetic coil and for switching the energizing direction to invert the direction of said magnetic flux, and a plurality of projection members formed of a magnetic material, said projection members being disposed within said coil bobbin at equal intervals around and in parallel with said valve member, one end of each of said projection members being adapted to create a magnetic pole which is inverted according to the direction of said magnetic flux generated by said electromagnetic coil, said one end of each of said projection members being opposed to each of said magnetic poles of said valve member;

said one end of each of said projection members disposed around the magnetic pole surfaces of said valve member being formed so that a part of one said end portion in the circumferential direction of each said projection member is different from the other portion of said projection member in the spacing from the opposed magnetic pole surface of said valve member or in the spacing from the opposed side face of said projection member adjacent thereto; and

(4) a plurality of fluid passages formed within said case and adapted to be brought into communication with each other through the fluid passage of said valve member upon rotation of said valve member at said predetermined angle.

4,561,630

VALVE

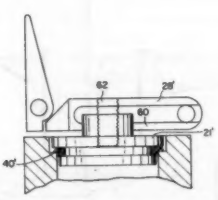
Alister L. McCulloch, Clayton, Australia, assignor to Chubb Australia Limited, Waterloo, Australia

Continuation-in-part of Ser. No. 346,796, Feb. 8, 1982, abandoned, which is a continuation of Ser. No. 176,614, Aug. 8, 1980, abandoned. This application Apr. 25, 1984, Ser. No. 604,123

Claims priority, application Australia, Aug. 10, 1979, 49772/79

Int. Cl.⁴ F16K *25/00*

U.S. Cl. 251—84 **2 Claims**



2. In a valve for sealing off pressurized fluid for an extended period,

a body defining a fluid passageway therethrough;

closure means for said passageway, said closure means including an arm pivotal on said body between a position in which the valve is held closed, and a valve open position,

catch means for retaining said arm in the valve closed position against the pressure exerted by said fluid;

means for releasing the catch means whereby to release the arm; and

a valve closure member carried by the arm, said closure member carrying sealing ring means to seal said passageway in the valve closed position, wherein the improvement comprises

means mounting said closure member for movement along the arm in a direction longitudinally of the arm, and for movement laterally of the arm to permit centering of the closure member within the passageway; and

screw means carried by the arm and co-operating with the closure member, said screw means being tightened to retain the closure member in its centered position.

4,561,631

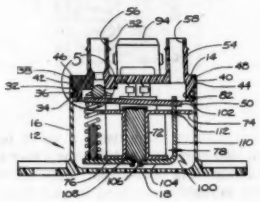
TURBO BOOST VALVE

Michael Slavin; Charles R. Martus, both of Troy, and Ellsworth S. Miller, Mt. Clemens, all of Mich., assignors to Lectron Products, Inc., Rochester, Mich.

Filed Jun. 8, 1984, Ser. No. 618,722

Int. Cl.⁴ F16K *31/06*

U.S. Cl. 251—129.20 **14 Claims**



1. A solenoid valve having

a casing formed in at least two parts one of which has a fluid passage including an inlet and an outlet one of which is formed at the inner end thereof with a valve seat;

a solenoid in said casing including a bobbin fixedly connected at one end to the part of said casing having said fluid passage, an energizable activating coil on said bobbin, a pole piece in said bobbin, and an armature at one end of said coil and said pole piece;

means providing a continuous flux flow path for electromagnetic current generated by said coil when energized including a stationary support connected to said pole piece and having a part thereof disposed a substantial distance laterally of said fluid passage, said pole piece being disposed intermediate of and spaced substantial distances laterally of both said valve seat and said support, and said armature being supported by pivot means on the mentioned part of said support and extending laterally therefrom between and transversely of said pole piece and said valve seat;

a valve element interposed between said valve seat and said armature actuable by the latter from and to said valve seat between closed and open positions to control flow of fluid through said passage;

spring means coactive with said armature urging the latter away from said pole piece and normally holding said valve element on said valve seat; and

adjustment means for establishing at assembly of the solenoid valve, simultaneously by a single forming operation, a predetermined spacing between said armature and said pole piece and a predetermined minimum spacing between the valve element and said valve seat when said valve element is in the fully open position, said adjustment means including a line of localized weakness in said armature intermediate said valve seat and said pole piece and laterally away from and out of said continuous flux flow path, whereby said forming operation can be performed by exerting deforming pressure against said armature opposite said valve seat using a tool of precisely predetermined length inserted into said fluid passage through said valve seat while holding said armature firmly against said support at said pivot means.

4,561,632
SOLENOID VALVE

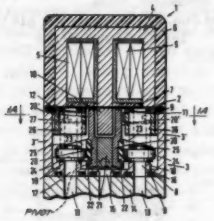
Klaus Hügler, Schorndorf, Fed. Rep. of Germany, assignor to J. Lorch Gesellschaft & Co. KG, Waldenbuch, Fed. Rep. of Germany

Filed Sep. 20, 1984, Ser. No. 652,615

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1983, 3334159

Int. Cl.⁴ F16K *31/07*

U.S. Cl. 251—129.15 **17 Claims**



17. A solenoid valve comprising a valve body defining a chamber with two ports and at least one valve seat within said chamber for controlling port-to-port flow via said chamber, a valve member movably mounted in said body for coaction with said seat, an armature external to said chamber and carried for movement with said valve member, said armature including a permanent magnet with two spaced arms defining opposed poles across an air gap therebetween, and an electromagnet mounted to said body and outside said chamber, said electromagnet comprising a three-leg core positioned to receive one armature arm between the center core leg and one of the outer core legs and to receive the other armature arm between the center core leg and the other of the outer core legs, the positioning and proportioning of core legs and armature arms being such that four air gaps are established between the respective adjacent faces of said core legs and said armature arms, and an excitation winding coupled to said center leg.

4,561,633
VALVE FOR ANIMAL WATERING TANKS

Adolf Haiges, Bönnigheim/Württ., Fed. Rep. of Germany, assignor to Suevia Haiges GmbH & Co., Fed. Rep. of Germany

Filed Jun. 30, 1983, Ser. No. 509,584

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1982, 8218670[U]

Int. Cl.⁴ F16K *31/00*

U.S. Cl. 251—339 **17 Claims**

1. A valve for an animal activated watering tank or the like, comprising:

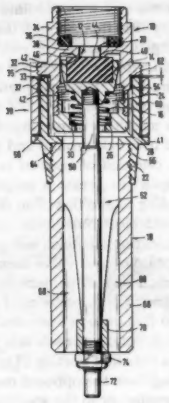
a colinear arrangement of a water supply sleeve attached to the tank, said sleeve being provided with an annular valve seat; and

a water supply valve-activating tube, which supports a spring-biased valve body which opens by tipping away from the valve seat as a result of a lateral deflection of an end of the tube remote from the sleeve;

wherein in the valve, which closes against water pressure, the sleeve is provided with an axial, annular shoulder, the diameter of which is larger than the diameter of the valve seat and against which a frontal surface of the tube nearest the annular shoulder is abutting when the tube is tilted by said lateral deflection of the said tube end;

wherein the sleeve is provided with an exterior collar which forms said annular shoulder and the tube is provided with an extension which is coaxial to said sleeve, said extension radially surrounds said sleeve, and the frontal surface of the tube nearest the exterior collar is abutting against the collar shoulder when the tube with its extension is tilted by said lateral deflection of said tube end;

said tube concentrically surrounding the sleeve with an axially extending concentric gap between the extension and sleeve that permits tilting of the extension; and



ring means mounted on the tube and being threadably engageable with the sleeve for locking the tube with respect to the sleeve.

4,561,634
SEAL OF A CYLINDER HEAD OF AN INTERNAL COMBUSTION ENGINE

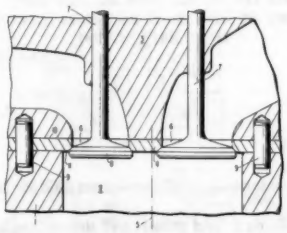
Karl Zeilinger, Bergien, and Reiner Bachschmid, Kernen, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 20, 1980, Ser. No. 132,133

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1979, 2911683

Int. Cl.⁴ F16K *41/00*

U.S. Cl. 251—364 **14 Claims**

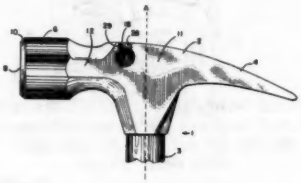


1. A sealing arrangement of the cylinder head with respect to the cylinder block of a reciprocating piston internal combustion engine by means of a flat seal means extending in the radial direction at least from the cylinder bore to the circumference of the cylinder collar, said flat seal means being provided with openings, characterized in that the flat seal means is constructed as intermediate plate which extends from the edge of a respective cylinder bore also to its axis while leaving free within the area of a respective cylinder bore essentially only circular openings for valve means, and thus represents a thermal insulation of the combustion space with respect to the cylinder head.

4,561,635
NAIL REMOVING HAMMER

Daniel R. Lamansky, R.R. 2, Fairfield, Iowa 52556

Continuation-in-part of Ser. No. 421,234, Sep. 22, 1982, Pat. No. 4,482,132, and Ser. No. 391,528, Jun. 24, 1982, abandoned. This application Nov. 23, 1983, Ser. No. 554,575
Int. Cl.⁴ B25C *11/00*
U.S. Cl. 254—26 R 7 Claims

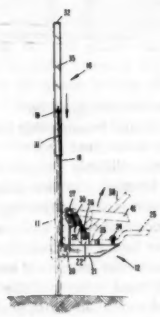


1. A nail-removing hammer having a head portion and a handle having an axis extending outwardly from a lower portion of the head, the head comprising a forwardly extending poll and a rearwardly extending nail-extracting claw, nail-removing means located at the upper surface of the head rearwardly of the poll and forwardly of the handle axis comprising a transverse bore having walls in a side wall of the head portion, and a sidewardly opening notch at the upper portion of the bore, said hammer also comprising a sidewardly opening claw located in a throat portion of the hammer.

4,561,636
FENCE POST DRIVING ASSEMBLY

Roger Moreland, East School R.R. #4, Owatonna, Minn. 55060, and William Moreland, R.R. #3, Princeton, Ill. 61356

Filed Aug. 16, 1983, Ser. No. 523,558
Int. Cl.⁴ E21B *19/00*
U.S. Cl. 254—29 R 17 Claims



1. A fence post driving assembly for use in combination with a vehicle having a draw bar and a three point lift arm mechanism having two outer lift arms and a safety link to drive a fence post into the ground, said assembly comprising:

(a) first means for mounting a first pulley means on the draw bar of the vehicle,

(b) second means for mounting a second pulley means at a location intermediate the two outer lift arms of the vehicle which lift arms are movable between upper and lower working positions,

(c) post engagement means for directly contacting the top of the fence post to be driven into the ground, and

(d) line means for extending around said first and second pulley means and being connectable at one end thereof to the post engagement means and at the other end thereof at a location near the draw bar,

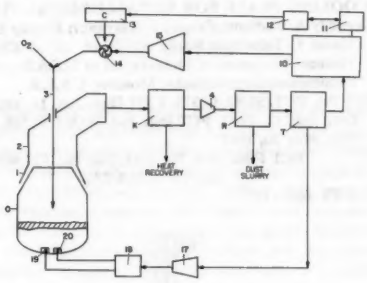
(e) the post engagement means having a top cap portion and a lateral support portion extending from the cap portion a delimited length downwardly along the fencepost to be driven,

(f) said delimited length being in an amount sufficient to prevent bending of said fence post being driven.

4,561,637
PROCESS AND APPARATUS FOR HEATING A STEEL BATH CHARGED WITH SCRAP

Francois Schleimer, Esch, Luxembourg, assignor to Arbed S.A., Luxembourg, Luxembourg

Filed Sep. 23, 1983, Ser. No. 534,977
Claims priority, application Luxembourg, Sep. 27, 1982, 84390
Int. Cl.⁴ C21B *7/22*
U.S. Cl. 266—81 23 Claims



1. A smelting/refining process for heating in a vessel a steel bath charged with scrap, said charged vessel comprising a first region, the first region comprising the steel bath with scrap charged thereto, and a single second region above the first region, including the steps of:

removing converter waste gas from said entire second region of said vessel, said waste gas containing CO;

processing said waste gas;

compressing said waste gas;

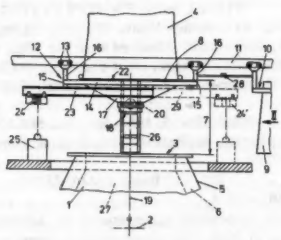
charging said compressed waste gas with a carbonaceous material; and

blowing said charged waste gas onto the surface of the bath.

4,561,638
INSTALLATION WITH A REFRACTORILY LINED METALLURGICAL VESSEL

Freidrich Laimer, Perg, Austria, assignor to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Dec. 31, 1984, Ser. No. 687,949
Claims priority, application Austria, Jan. 9, 1984, 33/84
Int. Cl.⁴ C21C *5/46*
U.S. Cl. 266—158 10 Claims



1. In an installation with a refractorily lined metallurgical vessel, such as a steel works converter, of the type including a

vessel mouth provided on the upper end of said metallurgical vessel, a chimney arranged at a distance above said mouth, a removable hood insertable between said vessel mouth and said chimney so as to connect said vessel mouth with said chimney, the improvement comprising a container to be introduced into the space available between said vessel mouth and said chimney after the removal of said hood so as to cover the lower end of said chimney and including at least one closeable bottom orifice, a carrying means for introducing said container, and at least one hoist provided on said carrying means and displaceable from laterally beside said vessel mouth to above said vessel mouth.

4,561,639

COOLING PLATE FOR METALLURGICAL FURNACES

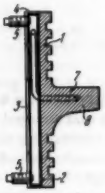
Gennady A. Kudinov; Grigory I. Kasyanov; Evgeny E. Lysenko; Alexei I. Tolochko; Vasily A. Yazev, all of Kharkov, and Vladimir M. Antonov, Zhdanov, all of U.S.S.R., assignors to Vnipicermetenergoochistka, Moscow, U.S.S.R.

PCT No. PCT/SU81/00073, § 371 Date Jun. 16, 1983, § 102(e) Date Jun. 16, 1983, PCT Pub. No. WO83/01788, PCT Pub. Date May 26, 1983

PCT Filed Nov. 16, 1981, Ser. No. 513,966

Int. Cl.⁴ C21B *7/10*

U.S. Cl. 266—193 **2 Claims**



1. A cooling plate for metallurgical furnaces, comprising a duct for a cooling medium and being in the form of a channel formed in a metal plate and oriented in the direction of the height of the plate, said channel having its rear and end sides, respectively, closed with rear and end cover plates, said channel being defined at one side by the plate and its opposite side by the rear cover plate spaced from said metal plate, and branch pipes provided on the rear cover plate adapted to feed a cooling medium into the duct and discharge the same therefrom, said duct having introduced thereinto a cooling pipe of a supporting projection so as to form a closed loop for circulation of the cooling medium.

4,561,640

WHEEL SUSPENSION SYSTEM

Kürt Enke, Kirchheim; Achim Hespelt, Stuttgart; Eberhard Hertler, Filderstadt; Manfred von der Ohe, Stuttgart, and Udo Saftien, Waiblingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

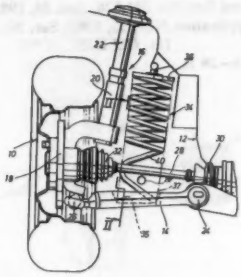
Filed Mar. 5, 1984, Ser. No. 586,135

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1983, 3307543

Int. Cl.⁴ B60G *11/16, 15/06*

U.S. Cl. 267—20 A **25 Claims**

1. Wheel suspension arrangement for automotive vehicles comprising at least one wheel control member, and a wheel suspension system including a coil spring and with at least one vehicle component arranged in the surrounding area of the coil spring, wherein the vehicle component penetrates an axial projection of the coil spring coil turn circumference between two spring turn sections of a spring turn exhibiting a larger



lead as compared with a regular lead of the coil spring, wherein the vehicle component is an axle shaft.

4,561,641

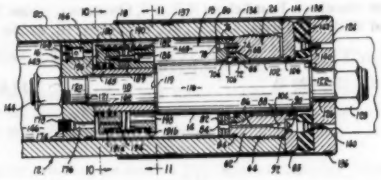
OFF-HIGHWAY VEHICLE RIDE STRUT AND METHOD

Simon A. DeYoung, Lyndhurst, and Manny H. Naft, South Euclid, both of Ohio, assignors to Clark Equipment Company, Buchanan, Mich.

Continuation of Ser. No. 943,449, Sep. 18, 1978, abandoned. This application Dec. 4, 1980, Ser. No. 212,862

Int. Cl.⁴ F16F *9/10*

U.S. Cl. 267—64.13 **18 Claims**



1. A vehicle ride strut comprising:

(a) an elongated tubular housing that is closed at one end and has an opening at its other end;

(b) a ported piston slidably disposed in the housing and separating the housing into two chambers;

(c) a shouldered piston rod projecting through the housing in slidably sealed relationship and connected to the piston;

(d) a compressible liquid substantially filling the chambers for compression as the piston rod moves into the housing and reduces the total volume of the chambers and expansion as the rod moves in an opposite direction in strut extension;

(e) a valve element positioned in one of the piston ports for permitting a flow rate from one chamber to the other during liquid compression that is higher than the flow rate as the liquid expands;

(f) an annular ported, spool member around the piston rod and interposed between the piston and the rod shoulder;

(g) a pair of springs of differing strengths disposed around the piston rod, the weaker of the springs being interposed between the piston and the spool member and the stronger being between the spool member and the rod shoulder;

(h) actuation means within the housing and coactable with the spool member to move it from a normal position spaced from the piston to a rebound position adjacent the piston;

(i) other structure within the housing acting against the spool member to maintain it in a normal position other

than when the actuation means acts on the spool member to move it to its rebound position; and,

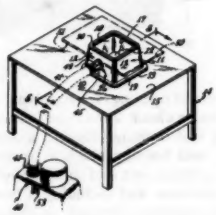
(j) at least one spool member port being in fluid communication with a piston port when the spool member is in its rebound position.

4,561,642

PORTABLE VACUUM HOLDING DEVICE

John P. Parque, 3801 Abbott Rd., Lynwood, Calif. 90262

Filed Mar. 16, 1984, Ser. No. 590,450
Int. Cl.⁴ B25B *11/00*
U.S. Cl. 269—21 **2 Claims**



2. A portable vacuum holding device for use in holding a planar wood workpiece in an elevated position above the flat surface of a workbench so that the workpiece can be operated upon, said device comprising:

a molded, rigid, upright, hollow body formed with four thin sidewalls tilting inwardly toward the top thereof;

said hollow body further provided with an internally extending flat rim about the top of the four sidewalls thereof defining a top rectangular opening and with an externally extending flat rim about the bottom of the four sidewalls thereof defining a bottom rectangular opening;

a flat sponge-rubber gasket secured on said top rim and a similar gasket secured on said bottom rim;

a molded sleeve including a thin-walld conically shaped portion provided on a larger diameter end thereof with a shoulder having an undersurface, said sleeve being provided with a plurality of spaced longitudinal grooves on the inner surface thereof;

said conically shaped portion of said sleeve being positioned in a circular opening provided on one of the sidewalls of said hollow body with the undersurface of said shoulder adapted to contact and be secured about the edge of said circular opening, said conically shaped portion of said sleeve adapted to seat therein

a conically shaped connector on an end of a flexible hose of a portable vacuum pump to provide a quick connect and disconnect thereto;

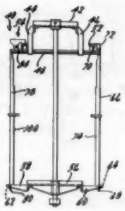
whereby when said upright hollow body is positioned with its gasket covered bottom rim resting on the flat surface of a workbench and a planar wood workpiece is placed on the gasket covered top rim of said hollow body to cover the top opening thereof, withdrawing of air by said vacuum pump from the enclosed chamber so formed causes said workpiece to be anchored to the top of said hollow body and the bottom of said hollow body to be anchored to the surface of said workbench while said spaced longitudinal grooves on the inner surface of said sleeve permit a controlled amount of air to enter the hollow body.

4,561,643

RACK ASSEMBLY

Donald R. Fulghum, Canton, and Ronald C. Muir, Whitmore Lake, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 6, 1984, Ser. No. 678,845
Int. Cl.⁴ B25B *1/20*
U.S. Cl. 269—43 **2 Claims**



1. A rack assembly used in the vacuum brazing of aluminum heat exchangers, said aluminum heat exchangers when being subjected to a brazing operation having a plurality of verticle fluid tubes intermixed with a plurality of verticle fin strips in a side-by-side relationship, said plurality of fluid tubes being in fluid communication at opposite ends thereof with horizontal header members, at least an upper one of said header members having a width dimension sufficiently large that said upper header member extends in its width dimension to a width greater than the width dimension of the fluid tubes and fin strips;

said rack assembly including:

an upper rack support structure having front and rear facing portions;

a pair of rails;

first mounting means for mounting said pair of rails from said upper rack support structure so that said pair of rails extend from said front facing portion to said rear facing portion thereof in a spaced-apart relationship, said spacing between said pair of rails being sufficient that fluid tubes and fin strips of a heat exchanger can pass therethrough while an upper header member thereof is supported on opposite sides thereof by said pair of rails;

upper locking structure holding means mounted on said rear facing portion of said pair of rails for holding a locking structure therein;

releasable locating structure holding means mounted on said front facing portion of said pair of rails for releasably holding a locating structure therein;

a lower rack support structure having front and rear facing portions;

lower locking structure holding means mounted on said rear facing portion of said lower rack support structure;

lower locating structure holding means mounted on said front facing portion of said lower rack support structure;

a locking structure defining a fixed stop surface extending between said upper locking structure holding means and said lower locking structure holding means; said stop surface of said locking structure being engagable with a rear verticle surface on a heat exchanger suspended between said pair of rails to position said suspended heat exchanger in the rack assembly; and

a locating structure defining a fixed locating surface extending between said upper releasable locating structure holding means and said lower locating structure holding means; said fixed locating surface of said locating structure being engagable with a front verticle surface on a heat exchanger suspended between said pair of rails to position and to locate said suspended heat exchanger in the rack assembly.

4,561,644

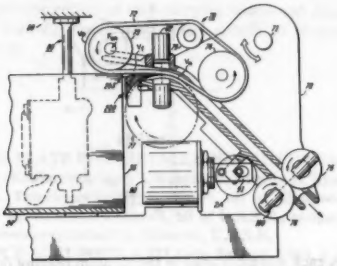
SHEET FEEDING AND SEPARATING APPARATUS WITH STACK FORCE RELIEF/ENHANCEMENT

Don P. Clausing, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 21, 1982, Ser. No. 420,964

Int. Cl.⁴ B65H *3/04*

U.S. Cl. 271—34 **9 Claims**



1. A high speed sheet feeding and separating apparatus for feeding and separating individual sheets from a stack of sheets, comprising the combination of:

an endless feeding and separating belt mounted for sheet feeding engagement with the front edge of the stack of sheets and applying a normal force thereto;

said feed belt being rotatably mounted between spaced supports to provide a deformable continuously unsupported section between said spaced supports;

a retard member having a supported curved frictional retard surface, said retard surface deformably engaging said feed belt in said unsupported section of said feed belt to form therewith a correspondingly curved separating retard nip in which said retard surface and said belt are continuously biased against one another;

a normal force relief means for automatically changing said normal force of said feed belt against the front edge of the stack while said feed belt continues maintaining contact with the stack of sheets, including a sensor positioned to one side of said separating retard nip and adapted to signal the presence or absence of a sheet as it comes into said separating retard nip; and

control means which in response to a signal from said stack force relief means will decrease the stack normal force of said feed belt against the stack of sheets if a sheet is present at said separating retard nip, and increase the stack normal force of said feed belt against the stack if a sheet is not present within a predetermined time at said separating retard nip.

4,561,645

DEVICE IN THE DELIVERY OF SHEET-FED ROTARY PRINTING MACHINE FOR INHIBITING CURL FORMATION IN THE LEADING EDGE OF DELIVERED SHEET

Gerhard Pollich, Heidelberg, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Fed. Rep. of Germany

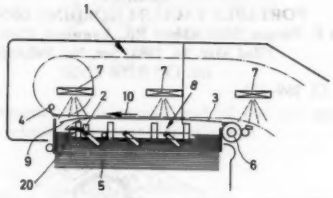
Filed Jul. 30, 1982, Ser. No. 403,794

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1981, 3130623

Int. Cl.⁴ B65H *29/24*

U.S. Cl. 271—195 **4 Claims**

1. In a delivery system of a sheet fed rotary printing machine having a conveyor for transporting a sheet in a given travel direction to a location of the delivery system at which a stack of sheets is deposited, a device for inhibiting curl formation in a leading edge of the sheet, comprising means for downwardly directing the sheet at the location at which the stack of sheets is deposited, and blowing units disposed at a location of the delivery system whereat, as viewed in the given travel direction of the sheet, a forward region of the stack of delivered sheets and a leading edge of the downwardly directed sheet are disposed, said blowing units having respective means located at opposite sides of the forward region of the stack and at opposite edges of the sheet adjacent the leading edge thereof for directing a controlled air jet, with one directional component in the travel direction of the sheet and another directional component towards the middle of the sheet, against the underside of the downwardly directed sheet in vicinity of the leading edge of the sheet tending to curl, said blowing units, respectively, comprising a housing block formed with a threaded



bore and air outlet openings for supplying air thereto via a hose connection and a check valve, and including fastening means for fastening said housing block to a respective lateral sheet straightener, said housing block is formed as a substantially rectangular cylinder, and said sheet straightener is located at a side of the delivery, and including a bracket formed with a threaded pin projecting through an elongated slot formed in said sheet straightener, said bracket being connected to said sheet straightener by a nut threadedly tightened on said threaded pin, and further including retaining screws fixing said housing block to said bracket, said housing block having a substantially rectangular side having a beveled region wherein said air outlet openings are formed.

4,561,646

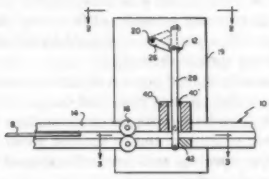
SHEET REGISTRATION MECHANISM

Richard G. Ellis, and Audra T. Alksninis, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 30, 1984, Ser. No. 645,586

Int. Cl.⁴ B65H *9/06*

U.S. Cl. 271—236 **9 Claims**



1. In an apparatus for transporting sheets, respectively notched at their leading edge, along a travel path, an improved registration means for registering said sheets, at a preselected location in said travel path, in both an in-track and cross-track direction, said registration means comprising:

an elongated member having a longitudinal axis substantially perpendicular to the plane of a sheet in said travel path;

means for supporting said member for movement transverse to its longitudinal axis and for selectively moving said member along its longitudinal axis to a first position intercepting said travel path adjacent to said preselected location or a second position remote from said travel path; and

means, located adjacent to said travel path, for receiving a portion of said member when said member is in said first

position, said means defining an opening substantially aligned with and complementary to the notch of a transported sheet whereby, when said member is in said first position, a transported sheet engages said member and that portion of said transported sheet forming the notch moves said member into the opening of said receiving means and, after said member is fully seated in said opening, said member urges said transported sheet in a cross-track direction until said member is fully seated in the notch to register said transported sheet in both an in-track and cross-track direction.

4,561,647

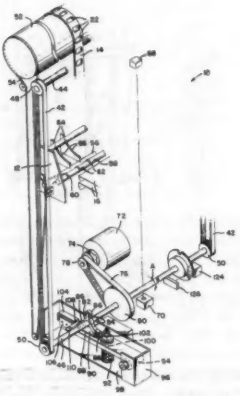
SHEET DEFLECTOR AND CONVEYOR DRIVE

Donald L. Snellman, 2807 W. Galer St., Seattle, Wash. 98199; Michael L. Kingsley, 14026 - 81st Pl. NE., and Bernard A. Pearson, 16305 - 88th Ave. NE., both of Bothell, Wash. 98011

Filed Feb. 13, 1984, Ser. No. 579,423

Int. Cl.[4] B65H *29/58*

U.S. Cl. 271—296 **18 Claims**



1. A sheet deflector drive for driving a sheet-delivering deflector between a plurality of vertically stacked paper-receiving shelves, comprising:

at least one deflector-carrying belt for moving said deflector between said shelves;

a rotatable drive shaft for driving said belt to move said deflector, rotation of said shaft in one direction moving said deflector upward and rotation of said shaft in the other direction moving said deflector downward;

a bidirectional drive motor selectively engageable with said shaft for rotating said shaft in one or the other rotational direction;

a cam connected to said shaft for rotation therewith and having at least three radially projecting lobes, said lobes having an angular spacing therebetween corresponding to the rotational movement of said shaft necessary to move said deflector from a sheet delivery position adjacent to one of said shelves to a sheet delivery position adjacent to an immediately neighboring one of said shelves;

a cam follower arm biased toward said cam for engaging said lobes, said follower arm rotating said shaft upon disengagement of said motor to bring said follower arm into simultaneous engagement with two of said lobes, said cam and said follower arm being aligned with said shaft to position said deflector in a sheet delivery position adjacent to one of said shelves when said follower arm engages said two lobes;

means for sensing positioning of said cam relative to said follower arm for selectively disengaging said motor from said shaft to place said deflector substantially in a sheet delivery position adjacent to a predetermined one of said shelves for final alignment and stabilization by said cam and said follower arm interaction;

means for sensing passage of sheets into said shelves and generating a sheet entry indicator signal to selectively engage said motor with said shaft for moving said deflector to a predetermined another one of said shelves to receive the next sheet; and

means for selectively disengaging said cam and said follower arm for movement of said deflector between distant ones of said shelves.

4,561,648

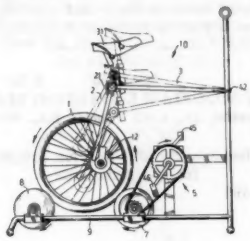
EXERCISING DEVICE

Shih-Jang Wu, 12 F-1, No. 303 Tung Hua N. Rd., Taipei, Taiwan

Filed Sep. 19, 1984, Ser. No. 651,956

Int. Cl.[4] A63B *21/00, 21/22, 23/04, 69/16*

U.S. Cl. 272—73 **1 Claim**



1. An exercising device comprisng:

a bicycle frame;

a rear wheel rotatively mounted at the rear end of said bicycle frame,

front and rear driven wheels;

a base frame supporting said bicycle frame and said driven wheels in such a manner that said rear wheel is rested on said driven wheels; and

chain drive means operatively connected to the front driven wheel for rotating said rear wheel;

characterized in that said bicycle frame includes two top tubes, one end of each is pivotally connected to a sleeve bearing which is fitted between two front forks of said bicycle frame; the other end of each of said top tubes is pivotally connected with a connector which is fitted with two rear forks of said bicycle frame, and said rear forks are connected to an eccentrically disposed hub of said rear wheel, such that a rider of said exercising device may simulate a riding motion and further carry out an up-and-down motion when riding said exercising device.

4,561,649

ADJUSTABLE REST FOR THE FEET OF THE HUMAN BODY WITH OPTIONAL EXERCISE FEATURE

Marjorie A. Forsythe, 343 S. Dearborn, Room 1219, Chicago, Ill. 60604

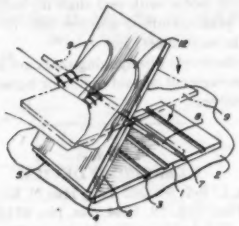
Filed Oct. 11, 1983, Ser. No. 540,504

Int. Cl.[4] A63B *23/04, 21/00, 21/02*

U.S. Cl. 272—96 **10 Claims**

1. A device for resting and exercising feet of the human body which is to be placed on a supporting member, said device comprising a first member adapted to be placed on said supporting member, second and a third members, means for rotatably connecting said second and third members together, means for connecting the second member rotatably adjacent to one end of the first member, means on said first member for providing adjustment of the angle between said second and third members, means on said third member adapted to cooperate with the adjustment means on the first member to afford

said angle adjustment between the second and third members, a fourth member upon which the feet of the human body are placed for rest and exercise, and means for securing said fourth



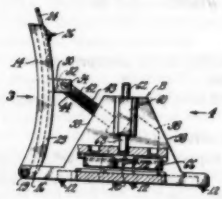
member to the second and third members contiguous with the connecting means between them, said securing means being located substantially at the midpoint of said fourth member.

4,561,650

TILT ADJUSTABLE STARTING BLOCK

Milton A. Newton, Jr., 4392 Pampas Rd., Woodland Hills, Calif. 91364

Filed Jun. 29, 1983, Ser. No. 510,203
Int. Cl.[4] A63K *3/02*
U.S. Cl. 272—105 **5 Claims**



1. A starting block comprising a base plate and a forward-facing foot contact plate disposed pivotally upstanding from a leading edge of the base plate, said base plate carrying selectively adjustable elevating mechanism adapted to progressively tilt and hold the foot contact plate at a selected tilt between upstanding and reclined positions,

said elevating mechanism comprising support means carried by the base plate including elongated, two-piece positioning means having an upslanted forward end pivotally connected to a rear surface of the foot contact plate, one piece of said positioning means comprising a threaded shaft and the other piece comprising an operating nut threadedly carried by said shaft, one of said pieces being lengthwise displaceable relative to the other when the other is held stationary, whereby rotation of the rotatable piece may effect extension or contraction of said positioning means toward or away from the pivotally connected foot contact plate so as to determine the tilt of said foot contact plate and to support it from the rear so as to oppose back pressure of a user's foot when pressed against the forward face of the foot contact plate.

4,561,651

WEIGHT LIFTING MACHINE

Robert W. Hole, 4785 Young St., Willowdale, Ontario, Canada (M2N 5M5)

Filed May 16, 1983, Ser. No. 494,871
Int. Cl.[4] A63B *21/06*
U.S. Cl. 272—117 **1 Claim**

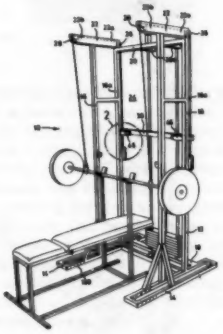
1. In a weight lifting machine having a frame which includes a pair of upright members and a stop bar mounted on the upright members through which weight retaining cables extend, and against which a weight arresting stop, which is carried by the weight retaining cables, is arranged to bear to limit the extent to which the weight, which is suspended from the cables may be lowered, the improvement wherein;

(a) each of said upright members has an inner face and a back face, said inner face is being disposed opposite one another,

(b) a plurality of mounting passages formed in said upright members and extending laterally therethrough from said inner faces, said passages being vertically spaced from one another and extending over a predetermined length of each upright member,

(c) a guide rail mounted on each back face of said upright members and extending vertically thereof over at least a major portion of said predetermined length,

(d) a slide member mounted on opposite ends of said stop bar and slidably engaging said guide rail to retain said stop bar against lateral movement while permitting vertical movement of said stop bar with respect to said upright members,



(e) a mounting bracket mounted at each end of said stop bar laterally inwardly from the slide members, each said mounting bracket extending forwardly from the stop bar to overlie the inner face of the adjacent upright,

(f) a latch mounted on and retained in each mounting bracket, each latch comprising a pair of latch pins slidably mounted in its associated mounting bracket, said pins being vertically aligned and being movable relative to said mounting bracket between a retracted position in which the latch pins are withdrawn from the mounting passages and an extended position in which the latch pins extend into said mounting passages to retain said stop bar against vertical movement along said guide rail, spring means normally urging said latch pins to an extended position, said latch pins being manually engageable to move said to a retracted position, and said stop bar being vertically movable with respect to said upright members when said latch pins are in said retracted position.

4,561,652

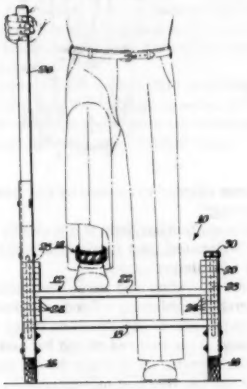
EXERCISING DEVICE FOR SIMULATING CLIMBING

William T. Wilkinson, P.O. Box 3567, Greenville, Del. 19807

Continuation-in-part of Ser. No. 235,419, Feb. 17, 1981, Pat. No. 4,340,218. This application Jun. 16, 1982, Ser. No. 388,881
Int. Cl.[4] A63B *21/12*
U.S. Cl. 272—119 **3 Claims**

1. An exercising device for simulating the action of climbing comprising a frame, a step including a platform, vertical adjusting means on said frame for selectively mounting said platform to said frame at one of a plurality of different selected positions whereby the height of said platform may be varied in accordance with the particular user thereof, said vertical adjusting

means permitting said entire platform to be selectively movable to said plurality of different positions to permit the user to select an appropriate excercising program said platform being the sole adjustable step secured to said frame, adjustable resisting means comprising a sleeve having at least one exposed pocket section, a weight removably mounted in said sleeve whereby the force of said resisting means may be varied in accordance with the particular user, and means for detachably securing said sleeve to the user whereby effort required by the user for stepping up and said step may be varied in accordance with the height of said platform and the amount of weight in



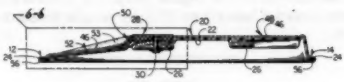
said sleeve, said frame comprising a pair of spaced side support means, a base member connected to and spanning said side support means, spacer means for being mounted on said base member for supporting said platform, each of said side support means comprising a pair of angle posts having an L-shaped cross-section with a pair of legs disposed in mirror-image relationship, a vertical hand support post being mounted against the legs of one of said angle posts and extends upwardly above said side support means, and said spacer means comprising a plurality of bars with each bar spanning and in contact with a respective pair of angle posts.

4,561,653

PORTABLE SOFTBALL PITCHING MOUND

Robert L. Wright, 4221 - 75th St., Des Moines, Iowa 50322

Filed Jun. 13, 1984, Ser. No. 620,275
Int. Cl.[4] A63B *71/00*
U.S. Cl. 273—25 **12 Claims**



1. A portable softball pitching mound, comprising:

a shell member having forward and rearward ends, opposite side portions and an upper surface area and being adapted to be supported by a support surface;

a pitching rubber mounted on said upper surface area and having forward and rearward edges and opposite side edges and an upper surface area;

said upper surface of said shell member extending substantially horizontally rearwardly from said rearward edge of said pitching rubber being substantially flat and coplanar with said upper surface area of said pitching rubber;

said upper surface area of said shell member immediately adjacent said forward edge of said pitching rubber having a first planar surface area sloping forwardly and downwardly to form a push-off area and merging into a second planar surface area sloping downwardly and forwardly to provide a resilient drag area extending to said forward edge of said shell member, said first surface having an inclination relative to said horizontal surface greater than said second surface relative to said horizontal surface, and

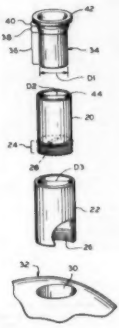
the distance from said forward edge of said pitching rubber to said forward edge of said shell member being less than the length of the pitching stride of the pitcher such that the first step of the foot starting on the upper surface of the shell member is on to the support surface forwardly of said shell member and the other foot is pivoted on said rubber and push-off area and then dragged into said flexible area so as to simulate actual outdoor field conditions.

4,561,654

DEVICE FOR ADJUSTING THE DIAMETER OF BOWLING BALL HOLES

Robert R. Haza, 2134 Gardner Rd., Westchester, Ill. 60153, assignor to Robert R. Haza, Westchester and Joseph Prestia, Worth, both of, Ill., a part interest to each

Filed Jul. 26, 1984, Ser. No. 634,870
Int. Cl.[4] A63B *37/00*
U.S. Cl. 273—63 B **17 Claims**



1. An insert for providing a variable inside diameter of a hole, said insert comprising a co-axial pair of telescoping tubes joined by a thread whereby the tube may be made longer or shorter by turning one of said tubes relative to another of said tubes, at least one of said tubes terminating at its upper end in a conical wedging shape; a flexible sleeve member associated with said telescoping tubes, said flexible member having an internal bore defining the hole and having a conical wedge surface on at least a portion of the outside of said sleeve near the entrance of the hole, said outside sleeve engagingly confronting the conical wedge shape terminating said one tube; and means for turning said one tube from outside the hole to cause said upper conical wedge to advance toward or to retract from the conical wedge on the outside surface of said flexible sleeve member, thereby constricting or relaxing the diameter of the entrance of the hole defined by said bore, the diameter at the entrance of said flexible sleeve over a continuous range extending from a fully relaxed to a fully constricted diameter.

4,561,655

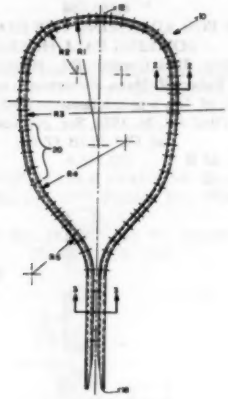
TUBULAR STEEL RACQUET FRAME HAVING VARYING CROSS-SECTION

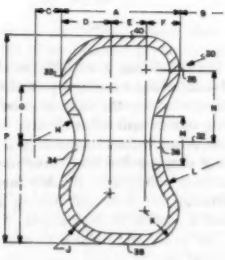
Raymond L. Mortvedt, Santee, Calif., assignor to Ektelon, San Diego, Calif.

Filed Jun. 14, 1984, Ser. No. 620,639
Int. Cl.[4] A63B *49/12*
U.S. Cl. 273—73 H **3 Claims**

1. A racquet having a head and a handle comprising: a con-

tinuous tubular steel frame having, in cross-section, a generally four sided configuration that is symmetrical about its minor axis, the four sides of said frame comprising first and second long sides which are opposite each other, two short sides which are opposite each other, and convex rounded corners connecting adjacent sides, a cross-section of said frame having a width of about 0.279 to 0.307 inch at its widest point, a height of about 0.490 to 0.510 inch, the first long side having a concave arc with a radius of about 0.118 to 0.126 inch from a point about 0.080 to 0.090 inch away from said frame's widest point along the axis of symmetry, the second long side having an arc with a radius of about 0.260 to 0.355 inch from a point about





0.215 to 0.325 inch away from said frame's widest point along said axis of symmetry, both short sides being connected to said first long side via convex rounded corners having a radius of about 0.118 to 0.128 inch from a point inside said tube frame about 0.122 to 0.132 inch from said axis of symmetry in a direction toward the respective rounded corner and about 0.118 to 0.128 inch from the widest point of said first long side, both short sides being connected to said second long side via convex rounded corners having a radius of about 0.070 to 0.110 inch from a point inside said tube frame about 0.150 to 0.178 inch from said axis of symmetry in a direction toward the respective rounded corner and about 0.070 to 0.100 inch from the widest point of said second long side.

4,561,656

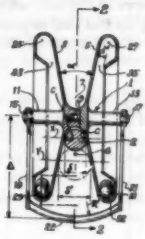
BAR RIDING WHEEL

Constant V. David, 4952 Field St., San Diego, Calif. 92110

Filed Jun. 28, 1984, Ser. No. 625,740

Int. Cl.[4] A63B *67/14*

U.S. Cl. 273—110 **19 Claims**



1. An apparatus adapted to be used by one hand of an operator and comprising:

a circular cross-section bar, held at one end by the operator's hand and supported, and partly restrained, at the other end by an articulation means;

a fixed support providing said partly restraining articulation means, thereby establishing a fixed set reference point for the bar movements, in any direction other than axial;

a handle located at the free end of said bar and providing the means to the operator for holding the bar free end, and for generating the bar free end movements;

a circular double-flanged V-grooved wheel assembly, the size of said groove being large enough to receive said bar and to allow said wheel to ride on the bar from one end to the other end; and

means for varying the bar circular cross-section from one end of the bar to the other end.

4,561,657

GOLF BALL

Ichiro Tominaga, Kobe, and Akihiro Nakahara, Ibaraki, both of Japan, assignors to Sumitomo Rubber Industries, Ltd., Kobe, Japan

Filed Feb. 3, 1984, Ser. No. 576,695

Claims priority, application Japan, Feb. 3, 1983, 58-17080

Int. Cl.[4] A63B *37/02, 37/06*

U.S. Cl. 273—218 **3 Claims**

1. A solid golf ball comprising a cured rubber product which is prepared from a composition comprising a polybutadiene rubber and zinc acrylate particles coated with a higher fatty acid, the amount of the higher fatty acid coated on the zinc acrylate particles being 5 to 15% by weight based on the zinc acrylate.

4,561,658

MATH MATCHING GAME

Amy L. Peterson, Rte. 2, Box 85, Clinton, N.C. 28328

Filed Dec. 31, 1984, Ser. No. 688,163

Int. Cl.[4] A63F *3/00*

U.S. Cl. 273—243 **11 Claims**

1. A math matching game and game board for teaching children certain math fundamentals such as multiplication, addition, subtraction, etc., said game and game board comprising:

A. a set of math problem cards with each card including a math problem thereon;

B. a set of playing tokens and chance means forming a part of said game with said chance means serving to establish movement values for the respective tokens during the course of said game;

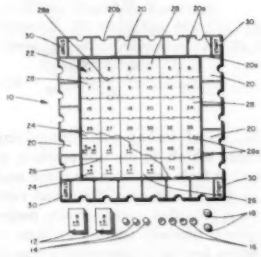
C. reward means forming a part of said game for rewarding

individual players for correct answers given during the course of the game;

D. a game board having a series of math problem card receiving areas formed on said board, one after another, each math problem card receiving area functioning to receive one or more of said math problem cards and to define one token movement increment on said board such that in the course of playing said game the respective tokens are moved and advanced from one receiving area to another;

E. a matching answer area formed on said game board and including a series of answer flaps with each answer flap including a problem answer thereon and wherein each answer flap is movably disposed with respect to said game board for being moved from a normally closed position to an open position;

F. said matching answer area further including a math problem matching area that includes a series of math problems that match and correspond with the respective math problems formed on said math problem cards;



G. said answer flaps being disposed over said matching math problems with each flap including a correct answer for the problem or problems it overlies in said closed position; and

H. wherein in said closed position said answer flaps hide the underlying problem or problems and in the open position the underlying problem or problems are visibly exposed such that in the course of playing the present game each respective token will be advanced about said game board and over the respective math problem card receiving areas and upon landing on a certain receiving area a selected player is given the opportunity to state the correct answer to that particular problem found on the uppermost card of that receiving area and thereafter the stated answer is checked for accuracy by lifting the respective answer flap having that answer thereon to see if the underlying problem or problems match with the problem presented and found on the math problem card presented that player.

4,561,659

DISPLAY LOGIC CIRCUIT FOR MULTIPLE OBJECT PRIORITY

James W. Redfield, Pottstown, and Albert J. Charpentier, Hatfield, both of Pa., assignors to Commodore Business Machines, Inc., West Chester, Pa.

Filed Jan. 6, 1983, Ser. No. 456,264

Int. Cl.[4] A63F *9/22*

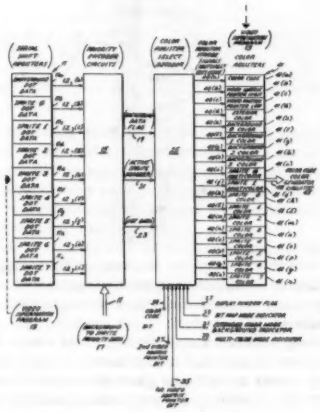
U.S. Cl. 273—313 **16 Claims**

1. A self-booting reconditioning display decision circuit for connection into a video processor where multiple object and background information is displayed according to assigned priority on a dot-by-dot basis, said video processor being used within a color television electronic circuit having available first and second non-overlapping clock pulses and a storage means including (a) data for producing sprite object and background video information, (b) data for producing background to sprite object priority signals, (c) data for producing color code signals, (d) data for producing first and second video matrix pointer bit signals, (e) data for producing display window flag signals, (f) data for producing bit map mode indicator signals, (g) data for producing extended color mode background indicator signals and (h) data for producing multicolor mode indicator signals, comprising:

register means connected to said storage means for receiving and storing said object and background video information in the form of a plurality of display instructions defining a plurality of said objects and background;

an encoding circuit connected to said storage means to receive said display object and background instructions and said background to object priority signals, and said encoding circuit being connected to said register means;

a decoder circuit, connected to said encoding circuit output, and providing any of a plurality of mutually exclusive output signals designating color register output enable signals, said decoder circuit providing said color register



output enable signals under control of said color code signals, said first and second video matrix pointer bit signals, said extended color made background indicator signals, said bit-map mode indicator signals, said multicolor mode indicator signals, and said display window flag signals;

a plurality of color registers connected to said storage means and holding a plurality of color individual display color instructions for object and background display, wherein each color register is enabled by one of said decoder enable signal outputs, each individual display color instruction selected being output from said color register to drive video generator circuitry; and

wherein said encoding circuit operates responsive to said first and second clock pulses, whereby said encoding circuit is preconditioned for processing signals loaded thereinto only during said first clock pulse period, and wherein said encoding operation is clocked only during said second clock pulse period.

4,561,660

DART MACHINE WITH ELECTRONIC MATRIX

Samuel N. Zammuto, Rockford, Ill., assignor to Arachnid, Inc., Rockford, Ill.

Filed Nov. 14, 1983, Ser. No. 551,018

Int. Cl.[4] A63B *65/02*

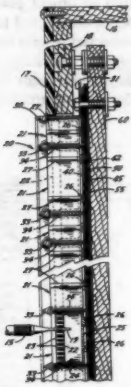
U.S. Cl. 273—376 **20 Claims**

1. A target for use in an electronic game with automatic scorekeeping capability having a front side to which projectiles are projected and an inner side, said target comprising:

a plurality of target sections for receiving said projectiles;

a target frame, in which said target sections are slidable inwardly and outwardly, and which holds said target sections in a predetermined array;

a pressure sensitive sensor matrix, located inward of said target frame, having first and second conductive contact layers separated by a non-conductive middle layer, said first conductive contact layer being pliable, said first and second contact layers having opposed pairs of contact points aligned with respective ones of said target sections, and said non-conductive middle layer having apertures through which the contact points in said first contact layer



are movable in response to pressure from aligned target sections to contact their respective opposed contact points to produce respective electrical contact-point indicating signals;

dampening means, located between said target frame and said pressure sensitive sensor matrix, wherein said dampening means comprises a sheet of material having apertures aligned with said target sections so that a distance is defined through which each target section must be inwardly displaced in response to the impact of said projectile in order to push against said sensor matrix and transmit, thereby, an impulse to said pressure sensitive sensor matrix.

4,561,661

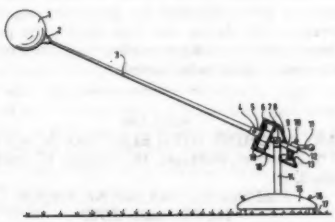
SOCCER TRAINING DEVICE ESPECIALLY FOR HEAD AND FOOT

Leo Walker, and Peter Walker, both of Kiergrubenweg 70, 7770 Donaueschingen 75, Fed. Rep. of Germany

Filed Jul. 17, 1984, Ser. No. 631,815

Int. Cl.[4] A63B *69/00*

U.S. Cl. 273—411 **8 Claims**



1. A soccer training device comprising, a base, a support member on said base, a ball fastened to a pole, an elastic bearing connecting said pole to said support member for the purpose of returning the ball to its initial position, said pole being a flexible rod, and said elastic bearing having a major axis concentric with respect to the axis of said pole, whereby said elastic bearing steadies the flight path of the ball.

4,561,662

FLEXIBLE METAL SEALING JOINT INCORPORATING EXPENDABLE PROJECTING PORTIONS

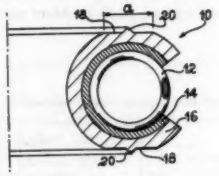
Raymond de Villepoix, Donzere; Jean Fages, Pierrelatte; Robert Forges, Bollene; Claude Abbes, Saint Etienne, and Christian Rouaud, Bourg Saint Andeol, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 24, 1984, Ser. No. 685,901

Claims priority, application France, Dec. 29, 1983, 83 21019

Int. Cl.[4] F16J *15/08*

U.S. Cl. 277—229 **4 Claims**



1. A flexible metal sealing joint comprising at least one elastic metal core which, in the rest position, is shaped like a torus, as well as at least one outer envelope made from a ductile material in which is inserted the metal core, wherein the outer envelope is provided over its entire periphery with two substantially planar opposite bearing surfaces and at least one projecting portion having a substantially triangular cross-section formed on each of the bearing surfaces, the dimensions of the projecting portions being such that these portions disappear entirely under the locking or tightening effect of the joint.

4,561,663

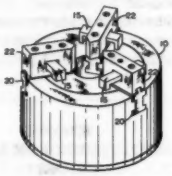
JAW LOCKING MEANS FOR LATHE CHUCKS

Thomas A. Ferraro, Hatfield, Pa., assignor to Lock Jaws, Inc., Conshohocken, Pa.

Continuation-in-part of Ser. No. 398,106, Jul. 14, 1982, abandoned. This application May 21, 1984, Ser. No. 612,257

Int. Cl.[4] B23B *31/10*

U.S. Cl. 279—123 **13 Claims**



1. In a lathe chuck having a master jaw guided for sliding movement relative to the chuck body in ways in the chuck body extending radially to the chuck axis by the jaw setting means of the lathe to a workpiece holding position, and a soft jaw mounted on and secured to the master jaw for conjoint movement therewith as a unit, the master jaw and the soft jaw being mounted for movement across the face of the lathe chuck as the master jaw slides in the ways, the ways and the master jaw having opposed surface portions limiting movement of the master jaw toward the chuck face, the improvement comprising:

a passage in the soft jaw extending transversely therethrough,

and means for frictionally locking said master jaw and soft jaw unit in a fixed position relative to the chuck body including

a block mounted in said transverse passage,

said block having portions extending laterally from sidewalls of the soft jaw in generally parallel relation to the chuck face,

leg members extending from said extended portions of said block towards the chuck face for frictionally engaging the same at the ends of said leg members, and

actuating means for causing the ends of said legs to come into frictional engagement with the chuck face and said soft jaw to move away from said chuck face to cause said opposed surface portions of said master jaw and the ways to be frictionally engaged so that said master jaw and soft jaw unit is frictionally locked in a fixed position relative to the chuck body.

4,561,664

TOBOGGAN

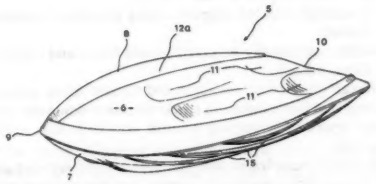
Raymond A. Cashmere, Charlestown, Australia, assignor to Luckit Pty. Limited, Mayfield, Australia

Filed Jun. 22, 1983, Ser. No. 506,716

Claims priority, application Australia, Jun. 30, 1982, PF4651

Int. Cl.⁴ B62B *13/08*

U.S. Cl. 280—18 **10 Claims**



1. A hand-toboggan having a body with an upper surface for supporting a rider, an outwardly dished bottom on the body which includes a longitudinally extending medial portion having a spaced pair of substantially longitudinally extending protruding ribs, and opposite lateral flanks upwardly inclined from the plane of said medial portion, said hand-toboggan being characterised in that each of said protruding ribs is of substantially rectangular cross-sectional shape near its forward end and becomes progressively more peaked towards its rearward end only on that one of its longitudinal outer edges remote from the other of said ribs, and one or more arcuate protruding ribs are provided in each of said flanks which curve from their ends inwardly towards said medial portion, to enable the tobogganist to steer in one direction or another by transferring his weight to an appropriate side of said toboggan.

4,561,665

COLLAPSIBLE SLED APPARATUS, AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Samuel J. McFrisby, Detroit, Mich., assignor to Joseph A. Ulicne, Grosse Ile, Mich., a part interest

Continuation of Ser. No. 304,244, Sep. 21, 1981, abandoned. This application Dec. 16, 1983, Ser. No. 553,178

Int. Cl.⁴ B62B *13/16*

U.S. Cl. 280—20 **3 Claims**

1. A collapsible sled for transporting articles, comprising:

a front section and a rear section substantially identical to said front section;

said front section having a first front hinge and an opposing first rear hinge;

said rear section having a second front hinge and an opposing second rear hinge;

said first rear hinge cooperating with said second front hinge to receive a pin for pivotally connecting said sections;

one section being pivotal with respect to the other through an arc of approximately 180°;

each section comprising a box-like member;

each said box-like member comprising a major support platform and side forming members depending from said major support platform;

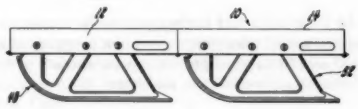
each said section having a pair of runners;

said runners being pivotally connected to each said section respectively;

each said runner comprising a lower shoe portion and an upwardly extended brace portion;

said brace portion having a longitudinally extending hinge portion;

cooperating hinge means provided on one of said sections, said hinge means operatively cooperating with said hinge portion of said runner brace portion;



said runner being pivotal from a position in which it is received within said box-like member and extends substantially parallel to said major support platform of said box-like member to a position in which said runner extends downwardly directly from and perpendicularly to said major support platform;

means for selectively locking said runner only in said downwardly extending position;

said box-like members being pivotally connected adjacent the lower edges thereof;

said box-like members being rotatable with respect to each other when said runners are respectively received therein, into facing contact with each other along the lowermost edges of said side forming members to form a closed box with said runners confined therein; and

said first front hinge cooperating with said second rear hinge to receive a means for securing said box in said closed position.

4,561,666

OPEN SLEIGH THAT DISASSEMBLES TO A GENERALLY FLAT STORAGE POSITION AND ASSEMBLES INTO AN INTERLOCKED OPERATING POSITION

James P. Aumann, 6251 Highway 73, Evergreen, Colo. 80439

Filed Jan. 3, 1984, Ser. No. 567,494

Int. Cl.⁴ B62B *13/16;* **B62C** *1/02*

U.S. Cl. 280—20 **22 Claims**

1. A sleigh adapted to be pulled over a snow surface by at least one horse comprising in combination:

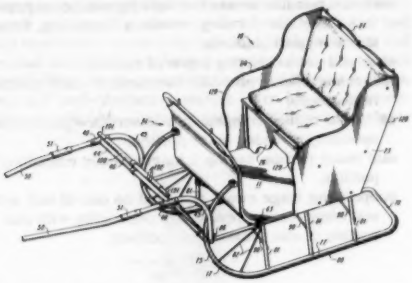
a generally rectangular flat planar floorboard having a front edge, a rear edge and two side edges;

a pair of longitudinally extending runners, each operably connected to said floorboard near each of said side edges between an operating position, wherein said runners support said floorboard at a raised position above said snow surface and a stored position wherein said runners are pivoted at said side edges from said operating position to the stored position, wherein said runners are generally adjacent to and in a parallel plane to that of said floorboard;

an interlocking body structure mountable to said floorboard including a pair of side panels, each temporarily mountable to said floorboard and a back panel connecting said side panels together, a vertical seat piece connected at a spaced distance forward of said rear panel to said side

panels and interlocking same, and a horizontal seat piece adapted to slidingly connect to said side panels; and

a front panel releasably connected to the floorboard along



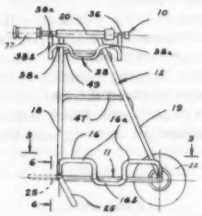
the front edge and further releasably connected to said runners, said releasable connection between said runners and said front panel providing a connection to a hitching assembly connectable to said horse.

4,561,667

SAILBOARDING EQUIPMENT VEHICLE

Frank S. Allia, 22 Forest Way, Essex Fells, N.J. 07021

Filed Sep. 4, 1984, Ser. No. 647,053
Int. Cl.[4] B62B *1/18*
U.S. Cl. 280—47.13 B **10 Claims**



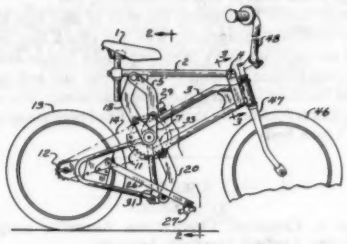
1. A sailboarding equipment vehicle in the form of a rackcart comprising a base and an upstanding frame elongated in a front to rear direction, said base having spaced wheels at the front end and a kick stand at the rear end of the base, the upstanding portion of the frame being offset slightly from the vertical to provide inclined support for a sailboard having a center edge portion resting on the base of said frame, the upper portion of said frame having an elongated tubular part extending from the front to the rear of said frame, said tubular part supporting a longer rotatable member with a hand grip portion protruding from the rear of the frame, means joined to said rotatable member at portions thereof externally of said tubular part protruding from the board side of the frame and having a downwardly offset portion for providing a board clamp in one position of rotation thereof, means for releasably securing said rotatable member in different positions of rotatable adjustment, said board clamp having offsets providing hook portions for suspending equipment from said frame when in the board clamping position, and the upwardly inclined portion of said frame on the side opposed to the board engaging portion thereof having vertically spaced means extending longitudinally of the frame for providing boom and mast racks, whereby all equipment needed for sailboarding can be mounted on and transported by said vehicle.

4,561,668

OPERATOR POWERED RECIPROCATING DRIVE SYSTEM

King L. Klopfenstein, 10 Drake Ter., Prospect Heights, Ill. 60070

Filed Apr. 5, 1984, Ser. No. 597,082
Int. Cl.[4] B62M *1/20, 1/04*
U.S. Cl. 280—226 R **19 Claims**



1. An operator powered reciprocating drive system for rotationally displacing a drive wheel, said drive system convertible between first and second modes of operation, said drive system comprising:

a frame;

a seat pivotally coupled to said frame;

first and second coupled support means pivotally mounted to said frame;

drive means rotationally mounted to said frame and coupled to said drive wheel;

first linkage coupled to said seat and to said drive means for rotating said drive means in a first direction when the weight of the operator is applied to said seat in a first mode of operation;

second linkage coupled to said first and second support means and to said drive means for continuing the rotation of said drive means in said first direction when the weight of the operator is transferred from said seat to said first and second support means in rotationally displacing the drive wheel in response to the alternate, reciprocating generally linear displacement of said seat and said first and second support means in a first mode of operation;

first coupling means mounted to said frame and to said seat for securely coupling said seat to said frame wherein said seat is no longer free to pivot with respect to said frame in a second mode of operation;

a control arm pivotally coupled to said frame;

means for disconnecting said first linkage from said seat and coupling said first linkage to said control arm in a second mode of operation;

means for decoupling said first and second support means;

means for decoupling said second linkage from said second support means; and

third linkage coupled to said second support means and to said drive means wherein said drive means and the drive wheel coupled thereto are rotated in a first direction in response to application of the operator's weight to and the resulting generally linear, reciprocating displacement of said first and second decoupled support means in an alternating manner in a second mode of operation.

4,561,669

MOTORCYCLE FORK

Stephen W. Simons, 2570 Leghorn, Mountain View, Calif. 94043

Continuation of Ser. No. 454,802, Dec. 30, 1982, abandoned.
This application Jan. 22, 1985, Ser. No. 693,047
Int. Cl.[4] B62K *25/05*
U.S. Cl. 280—276 **10 Claims**

2. A fork member for a telescopic motorcycle front wheel fork assembly having a pair of fork members, each having two

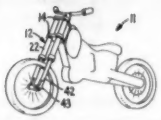
ends and each having a first and a second fork mount for mounting between the front wheel axle and a pair of triple clamps adapted for mounting on the steering stem of the motorcycle, said fork member comprising

an outer fork tube adapted to be connected to one of said fork mounts,

an inner fork tube telescopically mounted within said outer fork tube and adapted to be connected to the other of said fork mounts,

means for spring biasing said fork tubes in extended telescopic relationship whereby the fork tubes can telescope together,

a damper piston tube connected at one end to one of said fork ends and slidably receiving therewithin a piston on one end of a damper rod, the other end of said rod connected to said other fork end, and



a telescoping damping assembly at the other end of said damper piston tube and said one fork end for acting as a heavy damping mechanism on compression thereby cushioning any metal-to-metal bottoming, said telescoping damping assembly including

a bottoming piston having an outside cylindrical surface, and

a hollow cylindrical damper bushing housing having an enlarged diameter recess at its upper end for closely receiving said cylindrical surface of said bottoming piston,

one of said bottoming piston and said damper bushing housing mounted at said other end of said damper piston tube and the other of said bottoming piston and said damper bushing housing mounted at said one fork end.

4,561,670

FRAME FOR AUTOMATED TWO-WHEEL VEHICLES, AND METHOD FOR ITS MANUFACTURE

Minoru Takada, Houya, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

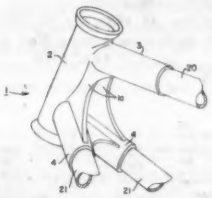
Filed May 23, 1983, Ser. No. 497,474

Claims priority, application Japan, May 28, 1982, 57-89799; May 28, 1982, 57-89800

Int. Cl.⁴ B62K *19/02*

U.S. Cl. 280—281 R **27 Claims**

1. A process for manufacturing a pipe frame for a two- or three-wheeled vehicle, comprising the steps of inserting a frame element having an outer cross section into a receptor arm having an inner cross section slightly larger than said outer cross section filling the clearance space between said



cross sections with thermosetting resin, and setting said resin simultaneously with the baking of finish of said pipe frame.

4,561,671

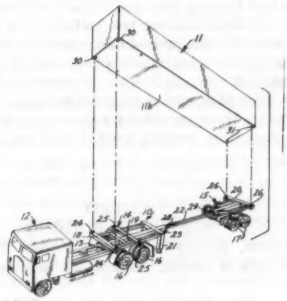
EXTENSIBLE CHASSIS FOR HAULING CONTAINERS

Nick DeWitt, Portola Valley, and Lindsey C. Greene, Foster City, both of Calif., assignors to X-Ten Corporation, San Francisco, Calif.

Filed May 3, 1983, Ser. No. 491,142

Int. Cl.⁴ B62D *53/06*

U.S. Cl. 280—404 **3 Claims**



1. A universal shipping container chassis, comprising:

a rear wheel assembly including a load-bearing portion adapted to securely receive and support a first end portion of a shipping container;

a fifth wheel assembly including a load-bearing portion adapted to securely receive and support a second end portion of said shipping container;

an elongate extensible stinger assembly for adjustably coupling said rear wheel assembly to said fifth wheel assembly, said stinger assembly including a stinger coupled to one of said rear wheel assembly and said fifth wheel assembly, and a tube for receiving said stinger coupled to the other of said rear wheel assembly and said fifth wheel assembly, whereby shipping containers of different lengths can be accommodated by said chassis;

said stinger defining a plurality of first apertures, said first apertures being vertically and horizontally spaced from each other;

said tube defining a plurality of second apertures, said second apertures being spaced vertically to correspond to the vertical spacings of said first apertures; and

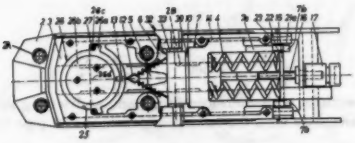
a pin for engaging one of said first apertures and one of said second apertures, thereby providing a selected extension of said stinger assembly corresponding to said shipping container's length.

4,561,672

SAFETY SKI BINDING

Engelbert Spitaler, Wr. Neudorf, Austria, assignor to TMC Corporation, Baar, Switzerland

Filed Nov. 23, 1983, Ser. No. 555,043
Claims priority, application Austria, Nov. 24, 1982, 4268/82
Int. Cl.⁴ A63C *9/08*
U.S. Cl. 280—618 **11 Claims**



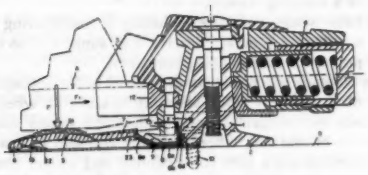
1. In a safety ski binding comprising a sole holder having at least two rear holding jaws which hold a ski shoe in a downhill skiing position and which operatively engage a shoe fitting which is secured to said ski shoe in the region of a shoe sole, said holding jaws being movable into a position which releases said ski shoe by means of a slide member supported for movement in the longitudinal direction of a ski against the force of at least one spring, wherein at least said shoe fitting or said holding jaws are provided with control surface means which control a release, the improvement comprising wherein said shoe fitting is arranged within a plane defined by said sole of said ski shoe and has two rear holding elements and at least one front holding element, which holding elements cooperate with said two rear holding jaws and at least one front holding jaw, wherein said front holding jaw includes first means for supporting it for limited pivotal movement about a vertical axis which extends as an extension of the axis of the tibia of the skier's leg, said two rear holding jaws each being oriented on opposite sides of a central longitudinal axis of said ski with second means being provided for preventing both of said rear holding jaws from moving toward said central longitudinal axis.

4,561,673

SAFETY SKI BINDING

Roger Pascal, Annecy-le-Vieux, and Rene Bressand, Saint Jorioz, both of France, assignors to Salomon S.A., Annecy, France

Filed Dec. 13, 1983, Ser. No. 560,845
Claims priority, application France, Dec. 13, 1982, 82 20852
Int. Cl.⁴ A63C *9/085*
U.S. Cl. 280—629 **75 Claims**



1. A safety ski binding for holding a boot on a ski and for permitting lateral release of a boot with respect to a ski, wherein said binding comprises:

(a) a jaw, adapted to hold one end of said boot and adapted to laterally release said boot;

(b) an elastic locking mechanism adapted to bias said jaw against lateral release of said boot; and

(c) compensation means for compensating for bias against lateral release of said boot arising from friction between said boot and said ski created during a forward fall, wherein said compensation means comprises a sensor producing a force on said jaw in response to downward movement of the front of said boot during a forward fall, wherein said force reduces said bias of said jaw against lateral release of said boot, wherein said sensor comprises:

(i) a pedal, adapted to pivot around an axis transverse to the longitudinal axis of said ski in response to downward movement of said front of said boot on said pedal; and

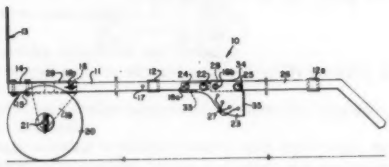
(ii) a reversing lever, comprising first and second arms each of which is adapted to pivot around an axis transverse to the longitudinal axis of said ski, wherein said first and second arms pivot in the opposite direction from said pedal in response to pivoting of said pedal, wherein said second arm contacts said jaw when pivoting and said first arm contacts said pedal.

4,561,674

MULTIPURPOSE HAND TRUCK WITH MOVABLE WHEELS

Lorenzo E. Alessio, Lecco, Italy, assignor to Black & Decker Inc., Newark, Del.

Filed May 23, 1984, Ser. No. 613,165
Claims priority, application Italy, May 26, 1983, 21973/83[U]
Int. Cl.⁴ B62B *1/04*
U.S. Cl. 280—655 **12 Claims**



1. A multipurpose hand truck, comprising:

a base frame defining a lengthwise direction;

a handle frame connected to the base frame and orientatable to different positions relative to the base frame;

a pair of wheels;

means for mounting said pair of wheels on the base frame to support the latter;

said mounting means being movable in location along the base frame and releasably securable thereto in at least two alternative locations spaced apart in said lengthwise direction;

a pair of plates connected to said base frame on opposite sides thereof and pivotal about a first axis, said handle frame also being connected to said plates and pivotal relative thereto about a second axis parallel to and spaced apart from said first axis;

first securing means for releasably securing said plates against pivoting relative to said base frame; and

second securing means for releasably securing said handle frame to said plates in different angular orientations relative to said plates.

4,561,675

AUTO IGNITION DEVICE

Gary V. Adams, Perry; Wilbur J. Ahlf, Ogden; George F. Kirchoff, and Rholand E. Lange, both of Brigham City, all of Utah, assignors to Morton Thiokol, Inc., Chicago, Ill.

Filed Apr. 2, 1984, Ser. No. 595,803
Int. Cl.⁴ B60R *21/00*
U.S. Cl. 280—734 **8 Claims**

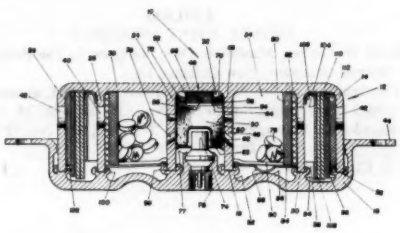
1. The combination of

an inflator for the generation of a gas to inflate a vehicle passive restraining crash protection bag, and

an auto ignition device,

said inflator having a housing structure containing a gas generant composition which when ignited generates a gas for the inflation of the crash protection bag, ignition

means for igniting said gas generant composition responsively to the onset of a crash of the vehicle in which said inflator is mounted, and filter means, said housing structure having ports therein for the passage of gas generated by said gas generant composition exteriorly of said inflator, said gas generant composition being characterized in automatically igniting when subjected to a predetermined high temperature that is substantially higher than the ambient temperature range to which said inflator normally is subjected, said housing structure, in order to minimize weight, being made of a material that degrades at said predetermined high temperature and thus has insufficient high temperature properties to contain the internal



automatic ignition pressures that tend to be developed in said housing structure at said predetermined high temperature, said housing structure having sufficient high temperature properties to contain the internal pressures within a range of high temperatures that is intermediate the said ambient temperature range and said predetermined high temperature, and

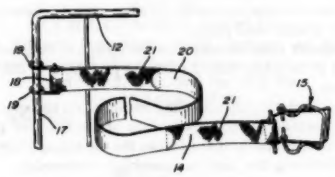
an auto ignition device contained within said housing structure in good thermal contact therewith for causing said gas generant composition to be ignited and thereby the inflator to function when said device is subjected to a predetermined temperature within said intermediate range of high temperatures.

4,561,676

SAFETY BELT FOR SHOPPING CART

Antoine Trubiano, Pointe aux Trembles, Canada, assignor to Cari-All Inc., Quebec, Canada

Filed Dec. 15, 1983, Ser. No. 561,802
Int. Cl.[4] B60R *21/10*
U.S. Cl. 280—801 **9 Claims**



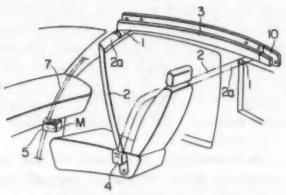
1. A child safety belt for attachment across a seat having an attaching side element for releasable securement of said belt thereto, said belt comprising a strap, a detachable securing buckle secured to at least one end of said strap, said securing buckle being formed from bent wires and defining a pair of jaw members pivotally interconnected on a pivot axis to move from a closed to an open position, a first of said jaw members having a throat portion to receive said side element therein, a second of said jaw members having a strap attaching end rearwardly and offset from said pivot axis in a direction toward said first jaw member whereby tension on said strap urges said second jaw member against said first jaw member when said side element is received in said throat portion and said jaw members are brought to said closed position, both said jaw members having opposed parallel side arms and a transverse end interconnecting arm, said interconnecting arm of one of said jaw members having a protruding end extending beyond the interconnecting arm of the other jaw member for finger engagement whereby to separate said jaw members when in said closed position.

4,561,677

PASSIVE SEAT BELT DEVICE

Osamu Kawai, Fujisawa, Japan, assignor to NSK-Warner K. K., Japan

Filed Feb. 21, 1984, Ser. No. 581,718
Claims priority, application Japan, Feb. 25, 1983, 58-25921[U]
Int. Cl.[4] B60R *21/10*
U.S. Cl. 280—804 **6 Claims**



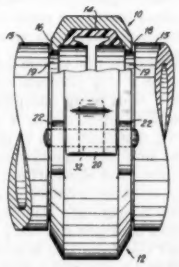
1. In a passive seat belt device in which a runner member with which a part of webbing is engaged is moved on a guide member by being driven by a driving means and thereby can assume a seat occupant restraining position and a seat occupant liberating position and a device for controlling a driving force of the driving means is provided, the controlling device includes means for detecting an ambient temperature and control means for controlling the driving force so as to be increased when the ambient temperature the detecting means detects is low and to be decreased when the ambient temperature the detecting means detects is high whereby the runner member moves on the guide member at a substantially constant speed irrespective of a change of the ambient temperature.

4,561,678

PIPE COUPLING

Donald R. Kunsman, Easton, Pa., assignor to Victaulic Company of America, Easton, Pa.

Continuation of Ser. No. 491,269, May 4, 1983, abandoned. This application Oct. 17, 1984, Ser. No. 661,653
Int. Cl.[4] F16L *23/00*
U.S. Cl. 285—39 **10 Claims**



1. In a pipe coupling of the type including plural arcuate coupling segments, engagement means on the inner periphery

of each said segment for securing the juxtaposed ends of pipe members, a gasket receiving channel in each coupling segment, and means securing said coupling segments to each other in end-to-end relationship, at least one of said securing means providing a hinge and another of said securing means providing a closure and locking means for said coupling, the improvement comprising:

said plural arcuate segments being of identical shape and configuration with each other;

said closure and locking means including;

parallelly arranged lugs extending radially outwardly of each end of each said coupling segment, said lugs being arranged and positioned for inter-fitting inter-engagement of the lugs at the juxtaposed ends of the coupling segments in the closed condition of said coupling;

a nose portion of at least one of said lugs extending beyond the plane of the associated end of its associated coupling segment and providing said inter-fitting inter-engagement of said lugs;

an undercut end portion of each said lug extending outwardly of the outer periphery of the associated coupling segment and facing oppositely from the adjacent end of the associated coupling segment, said undercut end portions being of identical contour when viewed axially of the associated coupling segment, said oppositely facing undercut end portions each providing for the temporary reception and location of a separate and independent toggle linkage used in closure of the coupling and providing reaction members for said toggle linkage during closure of said coupling; and

locking means extending transversely of said lugs through aligned apertures in the interfitted pairs of lugs and locking said coupling in its closed condition;

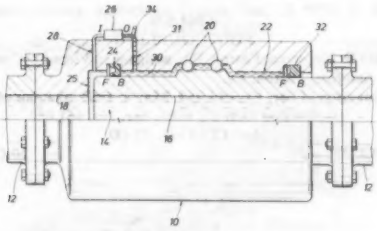
each of said lugs, in the assembled condition of the coupling, presenting an external contour when viewed axially of the coupling that is symmetrical on each opposite side of said inter-fitted lugs.

4,561,679

SEAL PRESSURE REDUCTION SYSTEM

Thomas G. A. Choate, Houston, Tex., assignor to Exxon Production Research Co., Houston, Tex.

Filed Jul. 26, 1982, Ser. No. 401,799
Int. Cl.⁴ F16L *27/02, 27/08*
U.S. Cl. 285—95 **4 Claims**



1. A seal pressure reduction system for protecting fluid seals against deterioration due to chemical action, temperature and pressure, said fluid seals being interposed in the sealing gap between two moving elements in a fluid-carrying system which transports a first fluid so as to prevent leakage of said first fluid into the ambiance, said system comprising:

means for retaining said elements together;

first seal means resistant to deterioration induced by chemical action and temperature, said first seal means having a front side and a back side and being located in said sealing gap such that said front side is in contact with said first fluid; second seal means resistant to pressure, said second seal means having a front side and a back side and being located in said sealing gap between said first seal means and the ambiance so as to form a sealed cavity between said first seal means, said second seal means, and said moving elements;

means for holding said first and second seal means in said sealing gap;

a second fluid different from the first fluid which is enclosed within said sealed cavity and is in contact with the back side of the first seal means and the front side of said second seal means; and

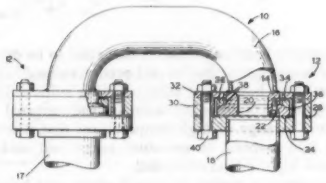
hydraulic pressure means actuated by the pressure of said first fluid for continuously pressurizing said second fluid to a pressure proportionately less than the pressure of the first fluid.

4,561,680

SWIVEL JOINT ASSEMBLY

David W. Gerber, Massillon, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Continuation of Ser. No. 552,843, Nov. 16, 1983, abandoned, which is a continuation of Ser. No. 238,268, Feb. 25, 1981, abandoned. This application Jul. 19, 1985, Ser. No. 756,575
Int. Cl.⁴ F16L *17/00*
U.S. Cl. 285—98 **1 Claim**



1. A swivel joint assembly for angular and lateral motion between a first and second conduit transporting a pressurized fluid comprising:

(a) an annular mounting plate rigidly connected at one face to a movable first conduit section;

(b) a first annular seal plate having a spherical convex surface at the periphery of one face, means for fixedly attaching said first annular seal plate to the opposite face of the mounting plate and said first annular seal plate sized so that the convex surface extends beyond the periphery of the mounting plate;

(c) a fixed second conduit section having a flange abutting the opposite face of the first annular seal plate, said flange having a diameter larger than the diameter of said first annular seal plate, the second annular conduit having a greater internal diameter than the internal diameter of the first annular seal plate;

(d) a spacer plate mounted on the flange of the second conduit section and spaced from the periphery of the first seal plate;

(e) a second annular seal plate mounted on the spacer plate, overlapping the convex surface of the first seal plate and circumferentially spaced from the mounting plate thereby maintaining the joint in assembled relationship;

(f) means for rigidly attaching together the flange of the second conduit section, the spacer plate and the second seal plate; and

(g) a seal member interposed between the first and second seal plates having a concave spherical surface mating with the convex spherical surface of the first seal plate and spaced from the second seal plate whereby, upon pressurization of the conduits, the net force acting on the opposite face of the first seal plate which radially extends within the internal diameter of the second conduit forces the seal member into slidable contact with the second seal plate, thereby sealing the joint, transverse movement between the conduits is effected within the space between the

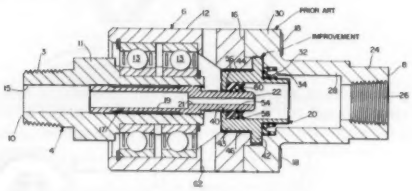
spacer plate and the first seal plate, rotary movement is effected by slidable contact between the seal member and the second seal plate, and movement in a plane perpendicular to the second seal plate is effected between the mating surface of the first seal plate and the seal member.

4,561,681

ROTARY UNION FOR HIGH PRESSURE GAS

Robert A. Lebsock, Las Cruces, N. Mex., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 25, 1983, Ser. No. 488,501
Int. Cl.⁴ F16L *27/00*
U.S. Cl. 285—276 **9 Claims**



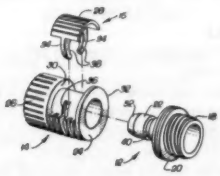
1. A rotary union for fluids comprising:
a housing;
rotor means located in the housing and extending outwardly therefrom for coupling to an outlet conduit, the rotor means having a central bore formed therethrough;
annular sealing means positioned within the housing and having a concentric groove formed therein;
shaft means connected at a first end portion to the rotor means and positioned at a second end portion thereof in sealing engagement with the sealing means;
means located in the groove for biasing the sealing means radially inwards for maintaining peripheral sealing engagement in response to minor eccentric motion of the shaft means;
enclosure means keyed to the housing and located between the sealing means and the housing for receiving the sealing means;
inlet means formed in the housing for receiving fluid for passage through the shaft means and rotor means to an outlet conduit; and
second sealing means positioned between the enclosure and the housing for preventing leakage therebetween.

4,561,682

QUICK CONNECT COUPLING

Craig R. Tisserat, Alta Loma, Calif., assignor to Rain Bird Consumer Products Mfg. Corp., Duarte, Calif.

Filed Sep. 3, 1982, Ser. No. 414,786
Int. Cl.⁴ F16L *37/14*
U.S. Cl. 285—305 **24 Claims**



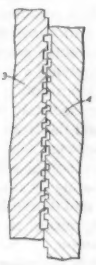
1. A quick connect coupling for releasably connecting a pair of conduits, comprising:
a first fitting for connection to one of the conduits and including a generally tubular male member having an external circumferential groove therein;
a second fitting for connection to the other conduit and including a generally sleeve-shaped female member for slidably receiving said male member, said female member defining a generally opposed pair of radially open arcuate slots and a pair of generally radially oriented cam surfaces formed generally at adjacent ends of said arcuate slots; and
a generally C-shaped one-piece retainer formed from a spring material and carried about said female member and including a generally opposed pair of locking arms joined to a central base and having free ends defining cam means respectively engageable with said cam surfaces and biased toward a normal position projecting through said slots for locking reception into said groove in said male member, said locking arms each being defined by a pair of generally parallel opposed axial faces extending generally radially relative to said female member, said locking arms being movable generally tangentially relative to said female member to displace said cam means on said locking arms generally radially outwardly along said cam surfaces thereby radially spreading said locking arms sufficiently to retract said arms from said groove;
said central base of said retainer being axially elongated relative to said locking arms, and said female member having a generally semi-annular cavity formed therein for reception of said central base.

4,561,683

PIPE CONNECTOR WITH INTERENGAGEABLE TUBULAR PIN AND TUBULAR BOX MEMBERS

Norman Lumsden, and Brian K. Phillips, both of Aberdeen, Scotland, assignors to Hunting Oilfield Services (UK) Limited, Aberdeen, Scotland

Filed Jan. 10, 1983, Ser. No. 456,697
Claims priority, application United Kingdom, Jan. 18, 1982, 8201249
Int. Cl.⁴ F16L *25/00*
U.S. Cl. 285—381 **8 Claims**



1. In a pipe connector comprising a tubular pin member having a frusto-conical outer peripheral surface and a tubular box member for receiving and engageable with said pin member, said tubular box member having a frusto-conical inner peripheral surface which overlies said frusto-conical surface of said pin member when said members are fully engaged together, wherein, to axially lock said members together, said frusto-conical surfaces of the members are provided with axially spaced apart, inter-engageable annular projections and grooves, corresponding pairs of which are interengaged when said members are fully engaged together, the improvement wherein said pairs of projections and grooves have differing axial extents and are arranged so that, as said members are brought into full engagement, in all intermediate positions of said members, after said frusto-conical surfaces have been brought into initial surface contact, there is contact between crests of at least some of said projections and surfaces between

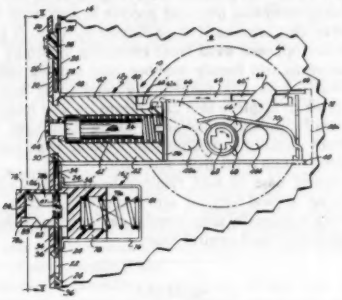
said grooves which are spaced apart along the length of the overlying parts of said surfaces so as to prevent premature inter-engagement of projections and grooves before said members are fully engaged together.

4,561,684

AUTOMATIC DEADBOLT

Robert A. Marotto, Auburn, Ala., assignor to Kysor Industrial Corporation, Cadillac, Mich.

Filed Jan. 27, 1983, Ser. No. 461,614
Int. Cl.⁴ E05B *63/20*
U.S. Cl. 292—150 **13 Claims**



1. A door lock assembly comprising:
a flat front plate assembly including spaced front and retainer plates defining a flat passage therebetween;
a deadbolt assembly including a tubular deadbolt housing and a deadbolt therein shiftable through said front plate assembly between an extended lock position and a retracted position, said deadbolt defining catch means generally aligned with said front plate assembly passage when said deadbolt is in said retracted position, said catch means being not aligned with said passage when said deadbolt is in said extended lock position;
means for shifting said deadbolt from said extended lock position to said retracted position;
biasing means for applying a bias on said deadbolt toward said extended lock position;
restraining means immediately behind said front plate and shiftable within said flat front plate assembly passage for shifting into engagement with said deadbolt catch means to restrain said deadbolt in said retracted position against the bias of said biasing means, and being shiftable out of engagement with said deadbolt to release said deadbolt to enable said biasing means to shift said deadbolt to said extended lock position;
and a trigger assembly including a tubular trigger housing separate from said deadbolt housing, said deadbolt and trigger housings being generally parallel, said trigger assembly extending through said front plate assembly for shifting said restraining means to disengage and release said deadbolt and thereby allow said biasing means to shift said deadbolt to said extended lock position.

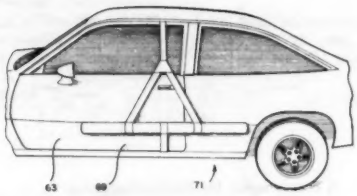
4,561,685

PROTECTIVE PAD FOR SIDE OF MOTOR VEHICLE

Ronald E. Fischer, 6716 Spoonwood La., Fort Worth, Tex. 76137

Filed Aug. 29, 1983, Ser. No. 527,228
Int. Cl.⁴ B60R *13/04*
U.S. Cl. 293—128 **4 Claims**

1. A device for protecting the side of a motor vehicle of the type having at least one door adapted to open and close by swinging about a generally vertical axis, comprising:
an elongated protective pad adapted to be located on the outside of the motor vehicle and next to said door,
a first flexible belt means comprising a Y shaped member having two flexible arms and a flexible central portion,
said two arms having first ends connected to said protective pad at spaced apart positions and second ends connected together and to a first end of said central portion,
said central portion having a second end with coupling means connected thereto,
a second flexible belt means having a first end connected to said protected pad between said spaced apart positions and a second end with coupling means connected thereto,
said two arms of said Y shaped member of said first flexible belt means and at least a portion of said second flexible belt means being adapted to be located on the outside of said door of said motor vehicle with a portion of said



central portion of said first flexible belt means being located around the top edge of said door and a portion of said second belt means located around the bottom edge of said door such that said two coupling means of said first flexible belt means and of said second flexible belt means may be coupled together on the inside of said door to support said protective pad on the outside of and adjacent said door in a generally horizontal position,
said central portion of said first flexible belt means and said second flexible belt means being relatively thin to allow said door to be closed with said protective pad located on the outside of and adjacent to said door and in a generally horizontal position,
said two coupling means being adapted to be coupling together such that said first and second flexible belt means may be tightened and secured in place looped around said door.

4,561,686

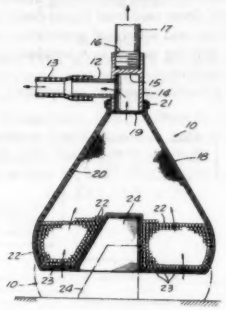
END EFFECTOR

Raymond Atchley, 3470 Mandeville Canyon Rd., Los Angeles, Calif. 90049

Filed Aug. 22, 1983, Ser. No. 524,910
Int. Cl.⁴ B66C *1/02*
U.S. Cl. 294—64.1 **6 Claims**

1. A device for gripping an object to lift or otherwise move the object comprising:
flexible sack-like enclosure means having a single relatively large opening and said enclosure means being fluid impermeable except for a plurality of relatively small openings arranged over a given gripping area;
a fluid permeable baglike means received within the enclosure means;
a quantity of particulate matter received within the baglike means;
selectively positionable means interconnected with the en-

closure means and baglike means for moving said enclosure and baglike means in a predetermined manner; and



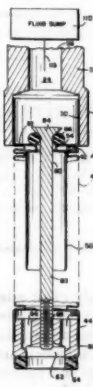
means interconnecting the enclosure means large opening with a source of low fluid pressure so that the enclosure means mechanically grips the object.

4,561,687

VACUUM GRIP DEVICE

Mark W. Bostrom, Melbourne, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed May 30, 1984, Ser. No. 615,479
Int. Cl.⁴ B66C *1/02*; B65H *3/08*
U.S. Cl. 294—64.1 **12 Claims**



1. A self actuating extractor assembly for vacuum retention of a plurality of workpieces comprising:

a vacuum pressure source;

head means, having fluid connection with said vacuum pressure source, for engaging and holding workpieces;

base means, structurally connected to said head means for supporting said head means; and

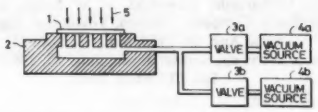
valve means, connected to said head means so that movement of said head means creates a corresponding movement of said valve means, for controlling flow through said fluid connection.

4,561,688

METHOD OF AND APPARATUS FOR ADSORBINGLY FIXING A BODY

Shinji Tsutsui, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 527,396, Aug. 29, 1983, abandoned. This application Apr. 29, 1985, Ser. No. 727,206
Claims priority, application Japan, Sep. 8, 1982, 57-157160
Int. Cl.⁴ B66C *1/02*
U.S. Cl. 294—64.1 **19 Claims**



1. A method of securing a body in a fixed position, said method comprising:

a first vacuum-adsorbing step of preliminarily vacuum-adsorbing said body to a chuck; and

a second vacuum-adsorbing step of vacuum-adsorbing said body to said chuck after said first vacuum-adsorbing step;

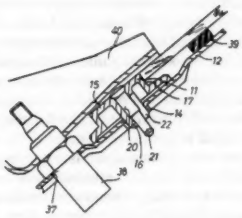
the vacuum adsorption produced by said first step being substantially weaker than the vacuum adsorption produced by said second step so as to relieve internal stress in said body, which results from a change in temperature of said body and said chuck.

4,561,689

DEVICE FOR SECURING A MOTOR VEHICLE WINDOW PANE

Willi Sprenger, Wallrabenstein, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 31, 1983, Ser. No. 547,023
Claims priority, application Fed. Rep. of Germany, Nov. 22, 1982, 3243101
Int. Cl.⁴ B60J *1/02*
U.S. Cl. 296—84 A **2 Claims**



1. Device for adjusting the mounting position of a vehicle window in a frame comprised of two side frame portions and upper frame portion and a sheet metal body panel portion at the lower edge of the window, comprising:

a cylindrical flanged aperture in the body panel below the lower edge of the window;

an eccentric member having an outer periphery in the form of a cam adapted to support the lower edge of the glass and serve to lift the window upon rotary movement of the eccentric member, said eccentric member having a hollow cylindrical portion extending into the cylindrical flanged aperture of the body panel to mount the eccentric member for rotation of the cam to effect said lifting of the window, said hollow cylindrical portion having a bore therethrough; and

a pin adapted to be forced through the bore of the cylindrical hollow portion of the eccentric member to spread the hollow cylindrical portion apart and thereby firmly secure

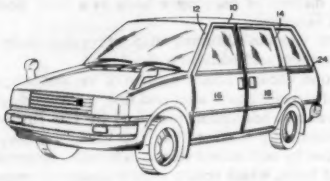
the hollow cylindrical portion of the eccentric member in a fixed rotary position in the cylindrical flanged aperture to retain the window at the adjusted position obtained by rotation of the eccentric member.

4,561,690

BODY STRUCTURE OF AUTOMOTIVE VEHICLE HAVING FRONT SWINGING DOOR AND REAR SLIDING DOOR AND HAVING NO PILLAR BETWEEN FRONT AND REAR DOORS

Tuneo Shinjo, Machida; Yoshiharu Nakamura, Atsugi, and Takayo Chikaraishi, Kawasaki, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Aug. 19, 1983, Ser. No. 524,581
Claims priority, application Japan, Aug. 23, 1982, 57-145857
Int. Cl.⁴ B60J *5/06*
U.S. Cl. 296—155 **10 Claims**



1. A body structure of an automotive vehicle comprising:
a vehicle body defining a single door opening on each of the two longer sides thereof:
a floor assembly constituting part of said vehicle body, said floor assembly having an upper surface which constitutes a vehicle floor;
a front swinging door hinged onto the front edge of the door opening and adapted to close the front moiety of said door opening; and
a rear sliding door suspended from a guide rail for sliding movement between open and closed positions, said rear sliding door adapted to close the rear moiety of said door opening when in its closed position;
wherein said floor assembly is supported by a lower frame work including side sills and a plurality of cross members, the lateral ends of the cross members being rigidly secured to said side sills and said guide rail is rigidly secured to the outer periphery of one of said side sills in such a manner that said guide rail can reinforce said one of said side sills to provide sufficient resistance to bending stresses applied to said one of said side sills; and
wherein said rear sliding door is also suspended from another guide rail rigidly mounted on a roof side rail, this other guide rail being adapted to reinforce said roof side rail to provide sufficient resistance to bending stresses applied to the latter.

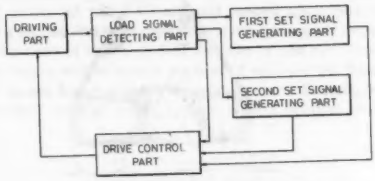
4,561,691

SAFETY DEVICE FOR ELECTROMECHANICAL OPENING AND CLOSING MECHANISM

Taneichi Kawai, Anjo, and Mituyoshi Masuda, Nagoya, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 30, 1983, Ser. No. 537,582
Int. Cl.⁴ B60J *7/04;* **E05F** *15/14;* **H02P** *3/00*
U.S. Cl. 296—216 **9 Claims**

1. A safety device for an electromechanical opening and closing mechanism with a mobile member, comprising:
driving means for driving said mobile member,
load signal detecting means connected to said driving means for detecting a load applied to said driving means and for producing a load signal corresponding thereto,
set signal generating means connected to said load signal detecting means for generating set signals as criteria for judging abnormal loads, and
drive control means connected to said load signal detecting means and said set signal generating means for comparing the load signal from said load signal detecting means with set signals from said set signal generating means and controlling said driving means in accordance with the result of said comparison;
said set signal generating means comprising,



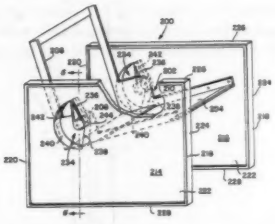
first set signal generating means for generating a first set signal which is higher than said load signal by a predetermined level and follows said load signal after delay of a predetermined time period,
second set signal generating means for generating a second set signal with a level determined by predetermined positions of said mobile member,
said drive control means including means for applying to said driving part a stop signal when the level of said load signal exceeds either of said first set signal and said second set signal.

4,561,692

ADJUSTABLE HEIGHT FURNITURE

James F. Yestadt, 666 Sixth Ave., New York, N.Y. 10010, and Frederick J. Yestadt, 264 Lexington Ave., New York, N.Y. 10016

Filed Jun. 23, 1983, Ser. No. 507,227
Int. Cl.⁴ A47C *3/20, 9/00*
U.S. Cl. 297—93 **19 Claims**



1. An adjustable height chair adapted to be supported on a chair supporting surface having a seat means and a seat means support structure, the seat means support structure comprising first and second support members arranged on opposite sides of said seat means and first and second pivot means having first and second generally parallel pivot axes for pivotally connecting said support members to said seat means, each said support member having a pair of opposite first sides and a pair of opposite second sides defining a generally rectangular cross-section in a plane generally perpendicular to its pivot axis, said support members being pivotable relative to said seat means about their respective pivot axes between a first position wherein a first side of each support member contacts the chair supporting surface and a second position wherein a second side of each support member contacts the chair supporting surface, the distance between each said pivot axis and each said first side contacting said chair supporting surface being greater than the distance between each said pivot axis and each said second

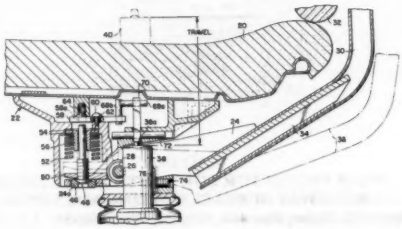
side contacting said chair supporting surface, whereby said chair has a greater height in said first position and a lesser height in said second position of said support members.

4,561,693

BACK SUPPORT TILT AND SEAT AND BACK SUPPORT HEIGHT CONTROL MECHANISM FOR A CHAIR OR THE LIKE

Alan Brownlie, Skaneateles, N.Y.; Jeffrey D. Crawford, Whitehall, and Harold A. Smith, Emmaus, both of Pa., assignors to Knoll International, Inc., New York, N.Y.

Filed Jun. 10, 1983, Ser. No. 503,227
Int. Cl.[4] A47C *3/30*
U.S. Cl. 297—306 **7 Claims**



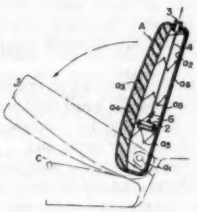
1. A tilt and height control mechanism for a chair or the like in which height adjustment is achieved by a gas cylinder and in which a back support tilts with respect to a seat support, said control mechanism comprising a gas cylinder actuator having a cam surface thereon and pivotally mounted so that said cam surface activates said gas cylinder upon pivotal movement of said actuator, and a blocker plate pivotally mounted for movement between one position in which it prevents tilting of said back support and another position in which said tilting of said back support is permitted, said actuator and blocker plate being coupled together so that pivotal movement of one is accompanied by pivotal movement of the other.

4,561,694

RECLINING ADJUSTER FOR CAR SEAT

Hideto Mouri, Ebina, and Nobuhiro Inoue, Akishima, both of Japan, assignors to Tachikawa Spring Co., Ltd., Akishima, Japan

Filed Dec. 20, 1983, Ser. No. 563,332
Claims priority, application Japan, Dec. 21, 1982, 57-194346[U]
Int. Cl.[4] A47C *1/024*; B60N *1/06*
U.S. Cl. 297—379 **6 Claims**



1. A reclining adjuster for a car seat having a seat cushion and a seat back pivotally connected to said seat cushion, said seat back having a side spaced from a side wall of the car, comprising:

an opening formed in said side of the seat back in the lengthwise direction of the car;

a lock pin fixed to said side wall of the car and projecting toward said side of said seat back through said opening;

L-shaped striker means, one leg of which is formed with a plurality of lock grooves said L-shaped striker means located within said seat back and pivotally mounted at a point spaced from said lock grooves,

spring means for normally biasing said lock grooves into locking engagement with said lock pin to prevent pivotal movement of said seat back; and

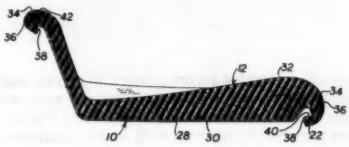
an operation knob connected to said striker means for pivotally moving said striker means, in a direction against the biasing force of said spring means, to release said lock pin from said lock grooves.

4,561,695

SEAT WITH FOAM SNAP-ON COVER

Willis MacCready, Jackson, Mich., assignor to Michigan Seat Company, Jackson, Mich.

Filed Feb. 23, 1984, Ser. No. 582,849
Int. Cl.[4] A47C *7/02*
U.S. Cl. 297—452 **1 Claim**



1. A flexible resilient synthetic foam seat comprising, in combination, a sheet metal contoured pan having an upper surface and having a bottom portion having a front, back and sides, a front portion extending upwardly from said bottom portion front having an inverted U-shaped configuration including a downwardly extending peripheral portion, back and side portions extending upwardly from said bottom portion back and sides each having a peripheral portion angularly related to the associated back and side portion and extending away from a vertical projection of said bottom portion, a peripheral edge defined upon said peripheral portions of said front, back and side portions, a synthetic foam cushion having a contoured lower surface complementary to said pan configuration and engaging said pan upper surface, said cushion having a cushion dimension thickness overlying said pan upper surface including said front, back and side peripheral portions, a homogeneous peripheral foam portion defined upon said cushion extending beyond said peripheral portion of said front, back and sides, a homogeneous deformable foam hook and lip defined continuously about said cushion peripheral portion extending about and around said peripheral portion's peripheral edge to mechanically connect said cushion to said peripheral edges with a snap-on action, said foam cushion including an upper surface, and a flexible cover affixed to said cushion upper surface extending thereover and about said hook and lip.

4,561,696

IN SITU RECOVERY OF MINERAL VALUES

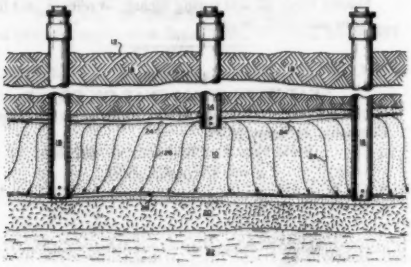
Charles W. Graves, Lake Elmo, Minn., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 21, 1982, Ser. No. 420,975
Int. Cl.[4] E21B *43/28*
U.S. Cl. 299—4 **10 Claims**

1. A method for the in situ recovery of mineral values from a permeable earth formation containing said mineral values, comprising:

(a) completing at least one first well in the mineralized formation at a first vertical level adjacent one of the top and the bottom of said mineralized formation;

(b) completing at least one second well in said mineralized formation at a second vertical level adjacent the other of said top and said bottom of said mineralized formation;
(c) forming a horizontally-oriented fracture in said mineralized formation at at least one of said vertical levels and extending across substantially the entire horizontal area of said formation between said first and second wells;
(d) each said fracture being in fluid communication with the one of said first and second wells which has been completed at the one of said vertical levels at which the fracture is located but not in fluid communication with the other of said first and second wells which has been completed at the other of said vertical levels;



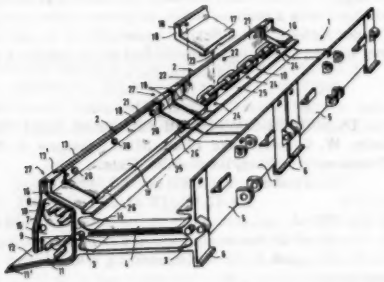
(e) injecting a leach solution, adapted to solvate said mineral values, into one of said first and second wells which is in fluid communication with a thus formed fracture, which thus becomes an injection well, under conditions and in a manner to initially flow horizontally through the fracture in communication with said injection well and essentially fill said fracture, thereafter flow vertically to the opposite one of said vertical levels and thence flow horizontally to the other of said first and second wells which has been completed at said opposite one of said vertical levels; and
(f) producing said leach solution, containing a significant amount of solvated mineral values, from the other of said first and second wells, which thus becomes a production well.

4,561,697

GUIDES FOR MINERAL MINING

Alois Hauschopp, Werne, Fed. Rep. of Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Nov. 21, 1983, Ser. No. 553,696
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1982, 3244039
Int. Cl.[4] E21C *35/20*
U.S. Cl. 299—43 **19 Claims**



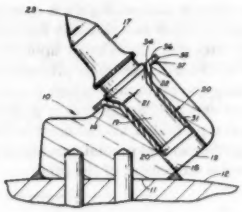
1. A guide for a mineral mining machine, said guide comprising: means defining upper and lower passages along which a drive chain is to be circulated, said means including a side cover covering at least the upper passage laterally and forming the mineral face side of an upwardly exposed guide surface along which the mineral mining machine is propelled by said drive chain, and a removable head plate for covering the upper passage solely from above, the head plate having an upper portion which forms the goaf side of said guide surface and which is attached to and at least partially located by the side cover, said head plate being separable from said side cover to expose the upper passage while leaving the side cover and its side of the guide surface intact.

4,561,698

WEAR PROTECTOR FOR TOOTH BRACKETS ON ROADWAY SURFACE CUTTING MACHINES

Donald E. Beebe, Box 464, Wapato, Wash. 98951

Filed Jun. 21, 1984, Ser. No. 623,022
Int. Cl.[4] E21B *10/62*
U.S. Cl. 299—86 **11 Claims**



1. A bushing and wear protector mountable along with a roadway surface removal wear tooth to a bracket, the wear tooth including an elongated shank formed along a central axis and leading axially from a butt end to a flared shoulder and a wear tip extending axially from the shoulder to a pointed end, and with the bracket including a shank receiving socket and having a bracket face surface encircling the socket and extending to peripheral bracket side edges, wherein the bushing and wear protector is comprised of:
an elongated spring sleeve having a spring sleeve thickness dimension between an inside spring sleeve wall and an outer wall, for rotatably receiving the wear tooth shank and for being removably received securely within the bracket socket;
wherein the spring sleeve includes an integral flared shoulder section of substantially equal thickness to the spring sleeve thickness dimension for rotatably receiving the flared shoulder of the wear tooth; and
an integral annular flange extending from the flared shoulder section to a peripheral edge and having a thickness dimension substantially equal to that of the spring sleeve thickness dimension, for covering the bracket face to the peripheral bracket side edges to prevent wear thereof and wherein the flange thickness dimension is such that the annular flange will wear at a rate substantially equal to that of the wear tooth.

4,561,699

BRAKE PRESSURE CONTROL DEVICE FOR VEHICLE BRAKING SYSTEMS

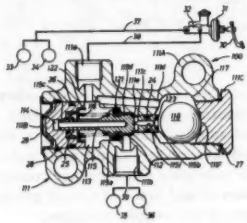
Yoshiharu Adachi; Masamoto Ando, and Takashi Nagashima, all of Kariya, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jul. 16, 1984, Ser. No. 631,308

Claims priority, application Japan, Jul. 19, 1983, 58-112014[U]; Sep. 14, 1983, 58-142990[U]; Sep. 16, 1983, 58-144010[U]; Oct. 18, 1983, 58-161005[U]; Jan. 24, 1984, 59-8498[U]

Int. Cl.⁴ B60T *8/26*

U.S. Cl. 303—24 F 21 Claims



1. A brake pressure control device for a vehicle braking system for incorporation between a master cylinder and a wheel brake cylinder, comprising:

a housing provided with an inlet port for connection to said master cylinder, an outlet port for connection to said wheel brake cylinder, and a stepped bore in open communication with said inlet and outlet ports;

a pressure responsive piston axially slidably disposed within said stepped bore to subdivide the interior of said housing into first, second and third fluid chambers, said first fluid chamber being ih open communication with said inlet port, said second fluid chamber being in open communication with said outlet port, and said third fluid chamber being in open communication with said inlet port and with said outlet port through said second fluid chamber, said piston being formed at one end portion thereof with a passage for providing a fluid communication between said first and second fluid chambers and at an intermediate portion thereof with a valve part located within said second fluid chamber;

a first annular valve seat arranged within said stepped bore between said second and third fluid chambers to cooperate with the valve part of said piston for controlling the flow of fluid between said second and third fluid chambers;

a spring arranged within said third fluid chamber for loading said piston towards said first fluid chamber and retaining it in an initial position in which the valve part of said piston is spaced from said first annular valve seat;

a second annular valve seat fixed to the one end portion of said piston, said second annular valve seat being exposed within said first fluid chamber and arranged in surrounding relationship with the passage in said piston; and

an inertia-controlled valve element in the form of a ball contained within said first fluid chamber to cooperate with said second annular valve seat, said valve element being placed in an initial position in which it is in abutment with an end wall of said stepped bore to be spaced from said second annular valve seat when the deceleration of the vehicle is below a predetermined value, and said valve element being brought into engagement with said second annular valve seat when subjected to the deceleration of the vehicle in excess of the predetermined value;

wherein said piston is arranged to be displaced against said spring to increase a space between said second annular valve seat and said valve element before the deceleration of the vehicle reaches the predetermined value under a heavy loaded condition.

4,561,700

SELECTOR VALVE FOR A PRESSURE CONTROL DEVICE IN A RAILWAY VEHICLE AIR BRAKE SYSTEM

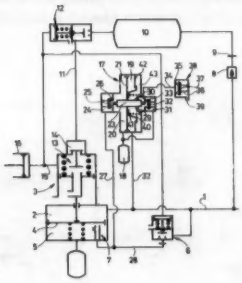
Bernd Goritz, Lohhof; Johann Hüber, Munich, and Peter Meinicke, Gauting, all of Fed. Rep. of Germany, assignors to Knorr-Bremse GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 2, 1984, Ser. No. 636,984

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1983, 3327903

Int. Cl.⁴ B60T *15/22*

U.S. Cl. 303—36 5 Claims



1. A pressure control device for air brakes for a railway vehicle comprising a triple pressure control valve having a constant pressure chamber, piston means in said triple pressure control valve connected to a main brake line, to said constant pressure chamber and to a brake cylinder such that said piston means is subjected to the respective pressures therein, a selector device comprising a selector reservoir and a selector valve, said selector valve having a piston one side of which is connected to the main brake line and another side of which is connected to said selector reservoir, valve means in said selector valve and having three operating positions including a middle position for filling the selector reservoir from the constant pressure chamber, for shutting off the selector reservoir and for emptying said selector reservoir, said valve means comprising first and second valves, said first valve adapted to be opened by said selector valve piston under a dominant load from the main brake line in one direction of stroke from its middle position, said second valve actuated by a dominant load from said selector reservoir from its middle position in the opposite direction of stroke to an open position in which the selector reservoir is emptied into the atmosphere, and buffer means including a pre-tensioned spring for urging said selector valve piston back to its middle position and to close said second valve such that the emptying of air from said selector reservoir is interrupted.

4,561,701

TANDEM SOLENOID VALVE ASSEMBLY INCLUDING PLURAL VALVE SECTIONS

Etsuo Fujii; Makoto Satoh, both of Saitama, and Mitsuo Toyoda, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 13, 1983, Ser. No. 541,731

Claims priority, application Japan, Nov. 20, 1982, 57-175849[U]; Nov. 20, 1982, 57-175850[U]; Nov. 20, 1982, 57-175851[U]; Nov. 20, 1982, 57-175852[U]

Int. Cl.⁴ B60T *8/02;* F16K *31/02*

U.S. Cl. 303—119 5 Claims

1. A solenoid valve assembly for use in an anti-lock braking system of the type including a modulator having an anti-lock

control fluid chamber, a source of pressurized control fluid to be supplied to the control fluid chamber during a locking preventing operation, and a reservoir to be connected to the control fluid chamber and to receive therefrom control fluid during interruption of the locking preventing operation, said assembly comprising:

a single casing having an internal shoulder;

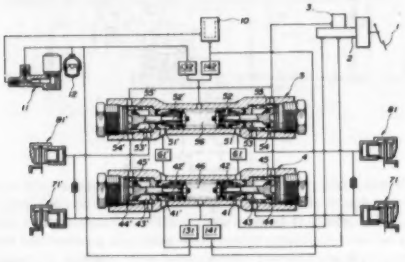
a single core mounted within said casing in abutment with said shoulder, said core having therethrough a fluid passage;

a fluid inlet for introducing pressurized control fluid into said casing in a direction to urge said core into abutment with said shoulder;

a first port for connecting said casing to a control fluid chamber of a modulator;

a second port for connecting said casing to a reservoir;

first valve means within said casing for movement between a normal closed position blocking said inlet and an open



position unblocking said inlet and providing communication between said inlet and said first port;

first means for urging said first valve to said closed position thereof;

second valve means within said casing for movement between a normal open position unblocking said fluid passage and providing connection therethrough of said first and second ports and a closed position blocking said fluid passage and preventing connection between said first and second ports;

second means for urging said second valve means to said open position thereof; and

first and second solenoid coil means surrounding portions of said core adjacent said first and second valve means, respectively, for selectively simultaneously moving said first valve means to said open position thereof against said first means and moving said second valve means to said closed position thereof against said second means.

4,561,702

CMOS ADDRESS BUFFER CIRCUIT

Hugh P. McAdams, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 9, 1984, Ser. No. 608,605

Int. Cl.⁴ H03K *19/096, 19/017, 3/037;* **G11C** *8/00*

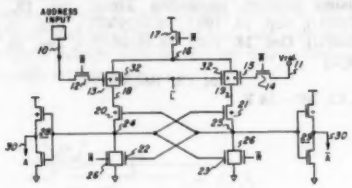
U.S. Cl. 307—475 **7 Claims**

1. An address buffer circuit for a semiconductor memory device or the like, comprising:

a double cross-coupled CMOS bistable flip-flop circuit having a pair of N-channel driver transistors and a pair of P-channel load transistors, each N-channel transistor having a source-drain path in series with the source-drain path of the corresponding P-channel transistor, the drains of the N-channel transistors providing output nodes, with the gates of the N- and P-channel transistors on each side respectively coupled to the drain of the N-channel driver transistor of the other,

a pair of P-channel input transistors, each having a source-drain path in series between the source-drain path of one of said P-channel load transistors and a supply node,

first and second N-channel gating transistors, the first gating transistor having a source-drain path connected between the gate of one of said pair of input transistors and an input node, the second transistor having a source-drain path



connected between the gate of the other of said pair of input transistors and a reference voltage,

a P-channel supply transistor having a source-drain path connected between said supply node and a voltage supply,

and a single activating clock voltage connected in common to the gates of said first and second gating transistors and to the gate of said supply transistor.

4,561,703

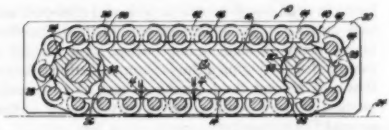
LINEAR RECIRCULATING ROLLER BEARING ASSEMBLY

Gustav H. Dabringhaus, Birmingham, Mich., assignor to Gustav Dabringhaus Revocable Trust, Birmingham, Mich.

Filed Jul. 29, 1982, Ser. No. 402,960

Int. Cl.⁴ F16C *29/06, 29/04*

U.S. Cl. 308—6 C **18 Claims**



1. A linear recirculating roller bearing assembly comprising a bearing body having a load bearing surface and a return surface defining a path for continuous recirculating movement of roller bearings thereabout, a plurality of substantially identical roller bearings disposed about said path in engagement with said surfaces, each of said roller bearings having a longitudinal axis and including at least two cylindrical load bearing portions and at least one cylindrical axle portion disposed intermediate said load bearing portions, said portions being substantially concentric with said axis and said axle portion having a smaller diameter than said load bearing portions, and a plurality of substantially identical retaining clips operatively interconnecting each of said axle portions of adjacent roller bearings to maintain the latter in predetermined spaced relationship and their axes substantially perpendicular to said path as said roller bearings travel thereabout, and wherein at least two of said retaining clips are operatively connected to said axle portion of any given one of said roller bearings and to said axle portion of an immediately adjacent roller bearing to one side of said given one of said roller bearings and the remaining retaining clips are disposed between the aforesaid two retaining clips and are operatively connected to said axle portion of an immediately adjacent roller bearing to the other side of said given one of said roller bearings.

4,561,704

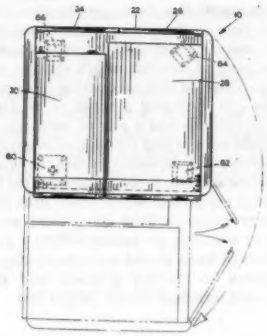
ATM ENCLOSURE

Charles L. Smith, Omaha, Nebr., assignor to JBA Company, Omaha, Nebr.

Filed Mar. 1, 1984, Ser. No. 584,989

Int. Cl.[4] A47B *85/06*

U.S. Cl. 312—222 **8 Claims**



1. An ATM enclosure adapted to be positioned on a floor surface comprising,

a hollow cabinet means having a front wall, back wall, first and second side walls, a top and a bottom,

said back wall having an access opening that is closed by a door,

a first supporting wheel secured to said cabinet means at the juncture of said back wall and said first side wall,

a second supporting wheel secured to said cabinet means at the juncture of said back wall and said second side wall,

a third supporting wheel secured to said cabinet means at the juncture of said first side wall and said front wall,

a pivot means secured to the floor surface and to said cabinet means at the juncture of said front wall and second side wall whereby said cabinet means may be pivotally moved about said pivot means, between operative and servicing positions, so that said access opening in said back wall will be more conveniently positioned to permit access to the interior of said cabinet means,

said pivot means including a base, means for securing said base to said floor surface, and coacting fastener means on said base and cabinet means such that said cabinet means is pivotally movable about said base upon securement of said base to a floor surface,

and means for locking said cabinet means in its operative position.

4,561,705

COMPARTMENTED TRANSPORT AND STORAGE CONTAINER

Gerhard Schäfer, Neunkirchen-Salchendorf, Fed. Rep. of Germany, assignor to Fritz Schafer Gesellschaft mit beschrankter Haftung, Neunkirchen, Fed. Rep. of Germany

Filed Apr. 19, 1983, Ser. No. 486,364

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1982, 8211051[U]

Int. Cl.[4] B65D *6/00*

U.S. Cl. 312—244 **13 Claims**

1. A storage and transport container comprising:

a pair of identical housings each unitarily formed of a synthetic resin with

a normally vertical back wall having upright and parallel side edges and horizontal top and bottom edges,

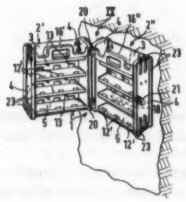
a pair of generally parallel side walls extending horizontally in one direction from the side edges,

respective generally parallel top and bottom walls bridging the side walls and extending in the one direction from the top and bottom edges, whereby the housing has a front side open in the one direction, the side and back walls having upper regions extending upward beyond the respective top walls,

respective annular rims projecting horizontally oppositely from the side walls;

at least one horizontally extending partition projecting in the one direction from the back wall intermediate the top and bottom walls, bridging the side walls, and forming two housing compartments, the top, side, and bottom walls each having a rear edge attached to the respective edge of the back wall and a front edge spaced in the one direction therefrom and lying generally in a plane parallel to the respective back wall, and

a loop formed generally at the front edge of the top wall, extending upward therefrom, and generally centered between the side walls, the loop being vertically shorter than the respective upper regions, the top wall being



raised at the respective front edge to each side of the loop; and

a hinge having one part at the respective rim at the front edge of one of the side walls of one of the housings and another part at respective rim at the front edge of the corresponding one of the side walls of the other housing and being articulated between the parts such that the two housings can swing about an axis generally parallel to the front edges of their one side walls between

an open position both open generally away from each other and

a closed position open toward each other, forming with the upper portions of the walls, the raised front edge of the top wall, and the loops respective upwardly open vessels, and the housings further having in the closed position their side, top, and bottom walls aligned with each other and the loops adjacent and forming a handgrip that is recessed between the vessels.

4,561,706

HOLLOW PUNCHED OBJECT FOR FORMING A STRUCTURE WITH BOX WALLS

Giorgio Grati, Milan, Italy, assignor to Ograd s.r.l., Milan, Italy

Continuation of Ser. No. 447,507, Dec. 6, 1982. This application May 7, 1985, Ser. No. 731,609

Claims priority, application Italy, Dec. 4, 1981, 23711/81[U]; Dec. 4, 1981, 23712/81[U]

Int. Cl.[4] A47B *43/00*; B65D *5/22*

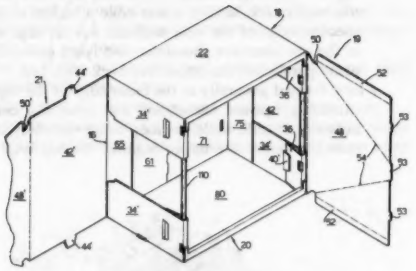
U.S. Cl. 312—258 **10 Claims**

1. A plurality of blanks for forming a box-like structure, a plurality of slideways, and a plurality of drawers, comprising:

a first blank including a rectangular back panel defined by two pairs of opposed score lines, a plurality of panel members extending outwardly from said score lines, said panel members foldable on each other to form, respectively, a bottom wall, an upper wall and side walls each connected to the back panel;

a plurality of slideway blanks for defining hollow rectangular slideways for application on inner surfaces of said side walls of said first blank;

a plurality of second blanks including a rectangular central panel defined by two pairs of opposed score lines, a plurality of panel members extending outwardly from said score lines, said panel members foldable relative to each other to form a hollow front wall, a back wall, and hollow side walls, said side walls having a rectangular cross section and each having a longitudinal offset for sliding engagement with said slideways;



said first blank when folded defining a self-supporting, box-like, drawer-supporting structure having an open front for slidably receiving a plurality of drawers carried on said guideways;

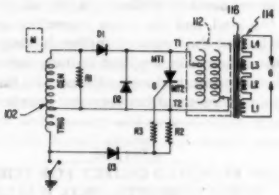
each said second blank when folded being a self-supporting box-like structure in the form of a drawer that is slidably received in the supporting structure formed from said first blank structure.

4,561,707

CURRENT-SHEET INDUCTOR NETWORK AND PULSE-FORMING SYSTEMS

Robert V. Jackson, Los Angeles, Calif., assignor to McCulloch Corporation, Los Angeles, Calif.

Filed Mar. 28, 1983, Ser. No. 479,742
Int. Cl.⁴ F23Q *3/00*
U.S. Cl. 315—209 CD **13 Claims**



1. An electrical energy storage and transfer device comprising:

a current sheet inductor network means having at least first and second conductive sheet means separated by and insulated from one another by a dielectric means to provide capacitive and inductive coupling therebetween; said current sheet inductor network means for receiving an electrical charge in response to electron flow caused in said sheet means, for storing the so-received electrical charge, and for discharging said electrical charge through electron flow in said sheet means, the electron flow at least during discharge sufficient to produce a consequent magnetic field; and

circuit means connected to said first and second conductive sheet means of said current sheet inductor network means for (a) applying a unidirectional current electrical charge to said current sheet inductor means by causing an electron flow in said conductive sheets, (b) storing said electric charge for a predetermined time period, and (c) discharging said electric charge by substantially shunting said so-charged first and second conductive sheets to cause an electron flow sufficient to produce a magnetic field that induces an output electric pulse in an electrical energy output means;

an inductor means in an inductive coupled relationship with said current sheet inductor network means to be cut by the lines of magnetic flux during production of a consequent magnetic field to thereby cause an electron flow in said inductor means wherein said inductor means comprises at least one wire of selected length to form an output coil wound to define an internal opening of selected diameter;

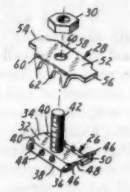
said output coil including a series of N discrete serially connected subcoils and a pair of terminals connected to the opposite ends of said output coil wherein the first and Nth subcoils have less windings than the subcoils intermediate the first and Nth subcoils such that the lower number of windings are present where fewer lines of force of said consequent magnetic field are present and the greater number of windings are present where a greater number of the lines of force of said consequent magnetic field are concentrated to thereby produce said electron flow through said terminals of said output coil.

4,561,708

CABLE SHIELD CONNECTOR

Mark D. Sorlien, White Bear Lake, and Manuel Filreis, Edina, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 30, 1984, Ser. No. 615,299
Int. Cl.⁴ H01R *4/66*
U.S. Cl. 339—14 L **19 Claims**



1. A connector adapted for attachment to a cylindrical cable having an outer protective polymer sheath and at least one underlying metallic shield enclosing a core of conductors which extend beyond the ends of the protective sheath and the shield, the sheath and shield being slit longitudinally of the cable, the connector comprising:

a resilient, electrically conductive inner shoe having a leading end for insertion between said shield and said core, a trailing end extending beyond the ends of said shield and said sheath, longitudinal edges connecting said inner shoe leading and trailing ends, a threaded stud disposed approximately midway between said leading and trailing ends and extending from said inner shoe and through said slit, and at least one radially outwardly struck barb adjacent each inner shoe longitudinal edge, said inner shoe being longitudinally flat between said leading and trailing ends and transversely concave with respect to said core;

a resilient, electrically conductive outer shoe overlying said sheath and having a substantially flat, rectangular body longitudinally aligned with the length of the cable and including a stud receiving hole, a leading end, a trailing end extending beyond the ends of said sheath and said shield, longitudinal edges connecting said outer shoe leading and trailing ends, and at least one pointed, sheath-piercing prong depending parallel to said stud from each longitudinal edge of said body portion to straddle said slit; and

a nut threaded on said stud and drawing said inner and outer

shoes into clamping engagement with said shield and said sheath so that said outer shoe prongs penetrate said sheath to contact said shield adjacent said sheath and said inner shoe barbs contact said shield adjacent said core, said prongs and said barbs being respectively disposed along said longitudinal edges of said outer and inner shoes to preclude opposite contact of said barbs and said prongs with said shield;

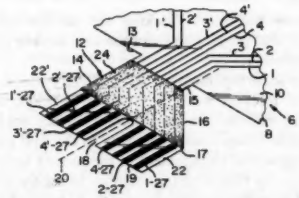
the resiliency of said inner and outer shoes being such that said concavity of said inner shoe is increased by contact with said outer shoe prongs through said shield and said outer shoe prongs are forced transversely outward by contact with said inner shoe through said shield so that energy is stored in said shoes to maintain said outer shoe prongs and said inner shoe barbs in contact with said shield despite compressive relaxation of said shield and independently of compressive relaxation of said sheath interposed therebetween.

4,561,709

MEMBRANE TYPE CIRCUIT HAVING IMPROVED TAIL

Kazutoyo Fukukura, Reading, Mass., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 9, 1983, Ser. No. 559,656
Int. Cl.⁴ H05K *1/00*; H01R *4/02*
U.S. Cl. 339—17 F **10 Claims**



1. An electrical circuit of the type comprising an insulating support having a multiplicity of terminal sites thereon, a plurality of circuit conductors extending between and among the terminal sites and connecting the terminal sites to each other, a flexible tail extending from the support, the circuit conductors having output terminal portions which are on one surface of the tail, the electrical circuit being characterized in that:

at least some of the circuit conductors are dual conductors having first and second conductor sections, the first and second conductor sections having first and second output terminal portions on the one surface of the tail,

the first and second output terminal portions of each dual conductor being aligned with each other on opposite sides of a fold line and being equidistant from the fold line, the fold line dividing the one surface of the tail into first and second tail surface sections,

the tail being folded along the line so that the first and second tail surface sections are opposed to each other and the first and second output terminal portions of each dual conductor are opposed to, against and in electrical contact with, each other, whereby

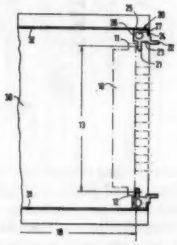
the first and second output terminal portions of each dual conductor are connected to each other in the tail to provide a common connection between preselected terminal sites.

4,561,710

SUBRACK FOR ELECTRONIC MODULES, PARTICULARLY PRINTED CIRCUIT BOARDS

Klaus-Dieter Bovermann, Breidenbach-Niederdieten, Fed. Rep. of Germany, assignor to Rittal-Werk Rudolf Loh GmbH & Co. KG, Fed. Rep. of Germany

Filed Nov. 7, 1983, Ser. No. 549,460
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1982, 3241016
Int. Cl.⁴ H05K *1/00*; H01R *13/20*
U.S. Cl. 339—17 M **19 Claims**



1. In a subrack comprising rigid side walls (30, 40) connected by cross-pieces (46) and having mounted in the rear area between said side walls, at a predetermined depth (18, 19) from the mounting plane (50) of a front panel, electrical connectors (10, 14) facing forward for receipt of terminal strips on the rear edges of electronic modules, the improvement comprising providing mounting means for the selectable mounting of said electrical connectors (10, 14) of a first and second type, said mounting means comprising two mounting bars (20) each having a first and second mounting flange (21, 22) extending outwardly therefrom, the mounting surface (44, 45), respectively, of each of said mounting flange having a different lateral displacement (34, 35), respectively, from a parallel corresponding plane (43, 33), respectively, intersecting the central axis of a bore (27) in said mounting bars, said mounting flanges having rows of threaded apertures (28, 29) therein at predetermined spacing, said mounting bars (20) connectable at their ends in a fixed, non-rotatable manner to said side walls (30, 40) in a first position with said mounting surfaces (44) of said first mounting flanges (21) providing mounting depth (18) suitable for said first electrical connectors (10) and said rows of threaded apertures (28) in said first mounting flanges (21) being separated by mounting distance (13) corresponding to said first type electrical connectors (10); and in a second position with the mounting surfaces (45) of said second mounting flanges (22) providing mounting depth (19) suitable for said second electrical connectors (14) and the rows of said threaded apertures (29) in said second mounting flanges (22) being separated by mounting distance (17) corresponding to said second type electrical connectors (14).

4,561,711

CONNECTOR SAVER ASSEMBLY

Milan Zrnich, Bensenville, Ill., assignor to GTE Communication Systems Corporation, Northlake, Ill.

Filed Dec. 24, 1984, Ser. No. 685,651
Int. Cl.⁴ H05K *1/00*
U.S. Cl. 339—17 C **3 Claims**

1. An arrangement for protecting electrical connectors of an electronic assembly when such an assembly is used to test plugin subassemblies such as printed circuit cards comprising:

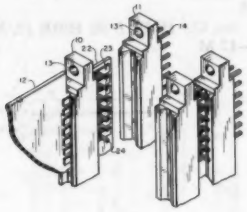
a connector of the type used in said electronic assembly having an elongated base with a plurality of connector pins arranged in an array in said base,

each pin including a wire terminating portion on a first side of said base, and said base including a slot on the opposing side, said slot dimensioned to receive a terminal end of a

printed circuit card, said pins projecting into said slot and arranged to contact corresponding contacts of a printed circuit card,

a terminal portion of a printed circuit card, including contact areas corresponding to said contact pins,

said connector projecting contact pins electrically connected to corresponding contact areas of said terminal



portion of said printed circuit card and include a first bend toward said terminal portion of said printed circuit card and a second bend perpendicular to said terminal card portions to facilitate access thereto for testing,

whereby said terminal portion of said printed circuit card may be inserted into said electrical connectors of said electronic assembly and cards to be tested are inserted into the connector of the present arrangement.

4,561,712

VERSATILE ELECTRIC CONNECTOR

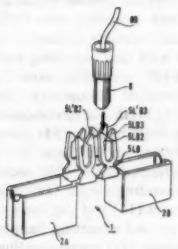
André Borne, Villeurbanne, and Jean-Paul Heng, Lyons, both of France, assignors to CGEE ALSTHOM, Levallois-Perret, France

Filed Feb. 24, 1983, Ser. No. 469,604

Claims priority, application France, Feb. 24, 1982, 82 03037

Int. Cl.[4] H01R *27/00, 4/24, 13/11*

U.S. Cl. 339—33 **5 Claims**



1. A versatile electric connector comprising:

at least one insulation displacement connector part in the form of a metal component which is a good conductor of electricity, said component being resilient and having a slot for gripping wire, said slot having a flared opening for stripping insulation from a wire inserted therein, the edges of said opening being sharpened so as to cut through the insulation of a wire which is to be connected before said wire is fully inserted in said slot; and

at least one additional contact part formed by an integral extension of said metal component, said additional contact part comprising a pair of lyre-shaped gripping parts having bases parallel to each other and face to face and having spaced contact arms extending from said bases, and wherein said contact arms of facing lyre-shaped gripping parts are bent towards each other from the base outwardly such that conductor bars may be inserted between the spaced contact arms of a given lyre-shaped gripping part, a cylindrical pin or a diameter slightly larger than the distance between two diagonally opposite arms of a pair of lyre-shaped gripping parts may be inserted between said pair of lyre-shaped gripping parts or a knife contact blade may be inserted parallel to the bases of the pair of lyre-shaped gripping parts and between the same, thereby allowing connections to be set up with said contact arms of said lyre-shaped gripping parts in any one of three perpendicular directions.

4,561,713

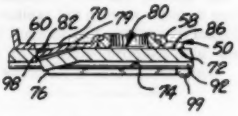
LAMP SOCKET BRACKET SYSTEM

Richard Laupot, New York, N.Y., assignor to Wythe Industries Inc., Clifton, N.J.

Filed Sep. 1, 1983, Ser. No. 528,430

Int. Cl.[4] H01R *13/62*

U.S. Cl. 339—74 R **19 Claims**



1. In a securing arrangement for securing any selected one of a plurality of brackets to a lamp socket, with the selected bracket secured only in a single predetermined orientation relative to the lamp socket, the improvement comprising:

a first securing member of relatively thin, resiliently flexible material for being affixed to the lamp socket, the first securing member having a first surface portion and a first guide means defining a longitudinal guideway along the first securing member juxtaposed with the first surface portion;

a resiliently deflectable locking tab on the first securing member and projecting from the first surface portion into the guideway;

a second securing member of relatively thick, inflexible material integral with the selected bracket, the second securing member having a second surface portion, a second guide means complementary to the first guide means for longitudinal engagement of the second securing member with the first securing member to secure the first and second securing members together, with the first and second surface portions confronting one another when the selected bracket is in the single predetermined orientation relative to the lamp socket, a further surface portion opposite the second surface portion, and an aperture extending between the second surface portion and the further surface portion;

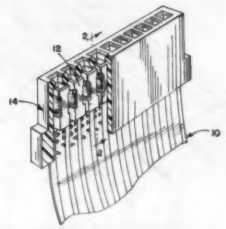
a lateral locking edge located on the second securing member along a portion of the periphery of the aperture for locking abutment with the locking tab upon engagement of the second securing member with the first securing member to lock the first and second securing members against disengagement; and

orientation means for allowing locking abutment of the locking edge with the locking tab only upon confrontation of the first and second surface portions and concomitant placement of the bracket at the single predetermined orientation relative to the lamp socket, the orientation means including a relatively rigid, non-deflectable tongue on the second securing member and projecting into the aperture adjacent the further surface portion so as to block access to the locking edge by the locking tab upon confrontation of the further surface portion with the first surface portion as a result of orientation of the bracket with the lamp socket in other than the single predetermined orientation.

4,561,714
CONTACT ASSEMBLY FOR RIBBON CABLE

Roger W. Byczek, Westchester, and Norman R. Wurz, Norridge, both of Ill., assignors to Bally Midway Mfg. Co., Chicago, Ill.

Filed Dec. 8, 1983, Ser. No. 559,237
Int. Cl.[4] H01R *13/39*
U.S. Cl. 339—97 P 6 Claims



1. An electrical cable assembly comprising, in combination, an electrical cable including a plurality of transversely-spaced, elongated strip conductors within a supporting body of flexible dielectric material, a contact element for each of said conductors and a non-conductive housing having locking ledges, and interior housing walls to separate adjacent contact elements, the walls together enclosing all of said contact elements, the improvement wherein each contact element includes a penetrating end and a contact end, said penetrating end having a generally flat body and a plurality of tangs extending directly from opposite edges of said generally flat body and of sufficient length to penetrate the dielectric material and a conductor, thus making electrical and mechancial contact with a single conductor, and to be crimped over without making contact with the tang projecting from the opposite side, said contact end including a tubular body defining an elongated opening for receipt of a mating pin, a locking tab deformed from the tubular body, the tab being deflected inwardly during insertion of the tubular body into the housing and then deflecting outwardly to lock into the housing locking ledges when the tubular body has been completely inserted into the housing, a plurality of resilient deflectable contact fingers deformed from said tubular body and integral with said tubular body adjacent its free end and extending inwardly toward said penetrating end so that the fingers have portions normally located in said elongated opening and moved out of said opening when said mating pin is inserted therein, the contact fingers further having outwardly turned distal end portions on the free end thereof being directed outward a distance greater than the thickness of the contact finger toward the housing wall to make contact between the free end of the contact finger and the housing wall such that upon insertion of a mating pin the fingers are deflected intermediate opposite ends to increase the contact force on the mating pin.

4,561,715
CABLE CONNECTOR COVER WITH INTEGRAL STRAIN RELIEF

Michael A. Sanchez, Phoenixville Pk. & Charlestown Rd., Malvern, Pa. 19335

Filed Feb. 29, 1984, Ser. No. 584,613
Int. Cl.[4] H01R *13/58*
U.S. Cl. 339—103 R 2 Claims

1. A cover for use as an electrical connector cover having in combination:

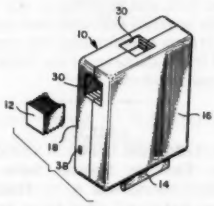
two generally rectangular identical half covers each comprised of a bottom wall, a first side wall, a second side wall, and one rear wall;

a connector retaining lip disposed on the edge of the bottom wall opposite to the said rear wall;

an exit through and in the center of the rear wall, opposite said connector retaining lip;

an exit through both the first side wall and the second side wall, disposed at the edge of each said side wall near the side wall's intersection with the said rear wall, said exits containing undulations therein and along the internal walls of said exits;

a plunger containing at least one surface having undulations thereon for ratcheting with the undulations within at least one of said exits;



wherein the said half covers are fixed together with the said bottom wall, first side wall, second side wall, and rear wall of each half cover defining an internal area within said connector cover; and

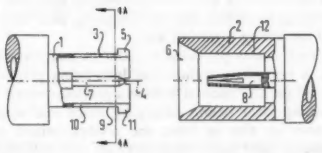
wherein an electrical conductor enters said internal area through one of the said exits and passes through the internal area to said connector retaining lip; and

wherein further said plunger is inserted into at least one of said exits such as to contact said conductor and exert a force on said conductor at the point of contact between said conductor and said plunger.

4,561,716
COAXIAL CONNECTOR

Edgar Acke, Oostkamp, Belgium, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 2, 1983, Ser. No. 557,771
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1982, 8235915[U]
Int. Cl.[4] H01R *17/18*
U.S. Cl. 339—177 R 1 Claim



1. In a coaxial connector comprising a first connector half with a first outer conductor sleeve arranged therewith and a second connector half with a second outer conductor sleeve, wherein said first sleeve, in a section facing said second sleeve, is divided, by means of axis-parallel slots into contact fingers evenly distributed over the circumference of said first sleeve each one of said fingers being provided at their free ends with a projection which is directed radially outward, said projections together defining a ringshaped bead, said second outer conductor sleeve comprising a mouth section with an inside diameter which expands conically, and a hollow cylindrical section adjoining the mouth section, said first sleeve being pluggable via said mouth section into said second conductor sleeve, said contact fingers engaging said mouth section first, said ringshaped bead having, in its unplugged condition, an outside diameter which is smaller than the maximum inside diameter of said mouth section but larger than the inside diam-

eter of said second outer conductor sleeve, an improvement which is comprised in that: said contact fingers extend, in their unplugged condition, parallel to the longitudinal axis of said first outer conductor sleeve, and further being straight and free of any prebend, said contact fingers are curved slightly inwardly towards their free ends in their plugged condition, thereby decreasing the distance between said first sleeve and mated inner conductors of said connector and the projections of the contact fingers are laterally curved, their outer radius of curvature being essentially equal to half the inside diameter of the hollow cylindrical section of the second conductor sleeve but less than the radius of curvature of the contact fingers at their respective fixed end such that as the respective projections are radially inwardly deflected their outer radii of curvature converge to form a conforming ring contact with an outer diameter equal to the diameter of the hollow cylindrical section of the second conductor sleeve.

4,561,717

OPTICAL SYSTEM FOR INFORMATION PROCESSING

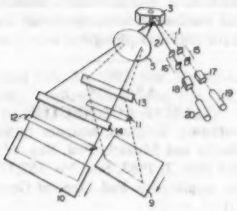
Keiji Katsoka, Kawagoe; Susumu Saito, Hachioji; Akira Arimoto, Musashimurayama; Akira Hashimoto, Ome, and Kinio Tatsuno, Kokubunji, all of Japan, assignors to Hitachi, Ltd. and Hitachi Koki Co, Ltd., both of Tokyo, Japan

Filed May 8, 1981, Ser. No. 261,760

Claims priority, application Japan, May 16, 1980, 55-63942; Apr. 1, 1981, 56-45424[U]

Int. Cl.⁴ G02B *27/17*

U.S. Cl. 350—6.8 **6 Claims**



1. An optical system for information recording comprising:

a single optical scanner for deflecting a plurality of laser beams which are incident thereon at different angles so as to scan different areas of a recording material;

at least one focussing lens for focussing said laser beams on said recording material; and

cylindrical lenses provided in front of said recording material, a respective cylindrical lens being provided in the optical path of each of at least a predetermined number of scanning laser beams emerging from said single optical scanner so that at least the predetermined number of scanning laser beams pass through said cylindrical lenses, respectively, to reach said recording material.

4,561,718

PHOTOELASTIC EFFECT OPTICAL WAVEGUIDES

Arthur R. Nelson, Stow, Mass., assignor to Sperry Corporation, New York, N.Y.

Filed Aug. 22, 1983, Ser. No. 525,067

Int. Cl.⁴ G02B *6/10*

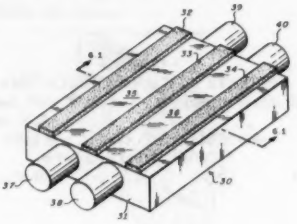
U.S. Cl. 350—96.14 **14 Claims**

1. Optical waveguide apparatus comprising:

an optically transparent crystal substrate having an effective index of refraction responsive to voltage gradients and stress applied thereto, said substrate comprised of a substantially planar body,

a plurality of coplanar rectilinear film stripes deposited only on one major surface of said substrate, said stripes being formed of a material having a predetermined inherent tensile stress when deposited and disposed so as to stress a region of said substrate underlying said stripes and patterned to provide at least one channel of increased relative index of refraction therebetween for propagating light waves incident thereon in the plane of said surface, and

means for applying a bias potential between at least one adjacent pair of said film stripes, said stripes of said pair



separated by a predetermined distance defining said at least one channel, the application of said bias potential causing a change in said stress induced refractive index so as to modulate said light wave energy in traversing said channel in accordance with the polarity and amplitude of said bias potential.

4,561,719

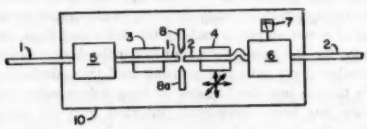
OPTICAL WAVEGUIDE SPLICING APPARATUS AND METHOD

Frederic J-Y Quan, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Mar. 1, 1982, Ser. No. 353,076

Int. Cl.⁴ G02B *5/14*

U.S. Cl. 350—96.21 **1 Claim**



1. In apparatus for splicing first and second sections of optical waveguide fiber having a core and a cladding, which apparatus includes optical fiber splicing means, first and second fiber retaining means for retaining first and second end portions of the sections in close proximity for splicing, at least one of said retaining means being movable such that the fiber end portions can be relatively aligned, light injection means positioned in proximity to the first fiber retaining means for injecting light through the cladding and into the core of a fiber section retained in said means, and optical power tapping means positioned in proximity to the second fiber retaining means for extracting through the cladding light propagating in the core of a fiber section retained in said means, the improvement characterized in that:

at least one of the light injection means and optical power tapping means comprises the following structure:

(a) opposing first and second fiber contact elements cooperating to constrain an optical fiber section enclosed therebetween to follow a corrugated path;

(b) said first fiber contact element being formed of a transparent material and comprising a rigid corrugated fiber contact surface;

(c) said second fiber contact element having a fiber contact surface formed of a resilient material adapted to conform to said rigid corrugated surface when in contact therewith;

(d) said resilient fiber contact surface being mirrored; and

(e) said rigid corrugated fiber contact surface being transpar-

ent to light injected into or extracted from the fiber through the fiber cladding.

4,561,720

TRANSPARENT REAR PROJECTION SCREEN

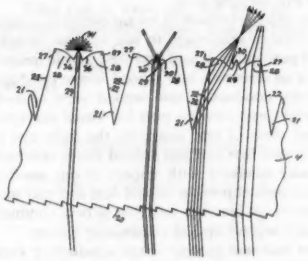
Erik Clausen, and Johannes Clausen, both of Gentofte, Denmark, assignors to Scan Screen A/S, Roskilde, Denmark

Filed Oct. 2, 1984, Ser. No. 656,997

Claims priority, application Denmark, Oct. 12, 1983, 4704/83

Int. Cl.⁴ G03B *21/60*

U.S. Cl. 350—128 **9 Claims**



1. A transparent rear projection screen (**4**) having a Fresnel-lens (**20**) on its rear side for paralleling light arriving from behind, and which in the front surface of the screen (**4**) has vertically extending grooves (**21**) with side flanks (**22**), each of which adjoins a side part (**27**) of an adjacent also vertically extending convex lens (**28**), said side flanks (**22**) being totally reflecting to parallelled light arriving from behind in order to increase the deflection in the lateral direction of a part of the light arriving from behind by reflecting said light into the adjacent lens (**28**), whereby the angle which a side flank (**22**) forms together with the adjacent lens side part (**27**) is so small that total reflection from the inner surface of said lens side part (**27**) of light which is totally reflected by means of the side flank (**22**) in question is avoided, and wherein at least one further lens (**29**) is arranged between the vertical lenses (**28**) to which the side flanks (**22**) adjoin, characterized in that the cross section of the further lens (**29**) is shaped as an isosceles triangle having a rounded top and that the side surfaces (**30**) of the triangular lens (**29**) form an angle with the normal to the screen which is so small that said side surfaces (**30**) are totally reflecting to parallelled light arriving from behind, said angle simultaneously being so great that the side surfaces (**30**) of the triangular lenses (**29**) allow emission of light reflected towards said side surfaces (**30**) from the side surfaces (**30**) opposite thereto.

4,561,721

ATTENUATOR FOR OPTICAL RADIATION

Fritz Keilmann, Stuttgart, and Karl-Wilhelm Kussmaul, Ostelsheim, both of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Foerderung de Wissenschafen E.V., Gottingen, Fed. Rep. of Germany

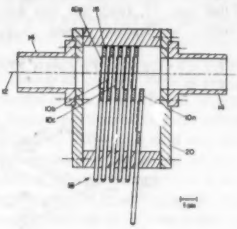
Filed Dec. 21, 1983, Ser. No. 564,097

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1982, 3247794

Int. Cl.⁴ G02B *5/18*

U.S. Cl. 350—162.17 **8 Claims**

1. An attenuator for a beam of optical radiation of a given wavelength propagating along a predetermined direction comprising a plurality of planar, multi-apertured sheet members positioned in spaced relationship along said direction to extend across said beam, each of the sheet members having a plurality of spaced-apart apertures forming a periodic pattern in two directions having a period in the range of one to ten times said given wavelength of the optical radiation, each of said sheet members forming a respective angle with said predetermined



direction, the angles formed by said sheet members being mutually different and different from 90°.

4,561,722

BEAM DIVIDER

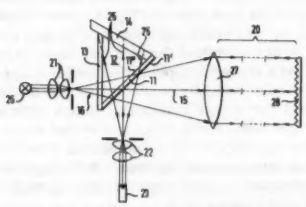
Klaus Smetana, Grünwald, Fed. Rep. of Germany, assignor to Erwin Sick GmbH Optik-Elektronik, Waldkirch, Fed. Rep. of Germany

Filed Aug. 11, 1983, Ser. No. 522,300

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1982, 3231265

Int. Cl.⁴ G02B *27/14*; G01N *21/59*

U.S. Cl. 350—171 **10 Claims**



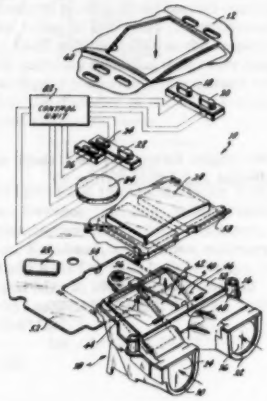
1. In apparatus for measuring optical transmissivity along a measuring path, said apparatus including light transmitting means for transmitting a beam of light along said measuring path, a retroreflector disposed at an end of said measuring path for retroflecting said beam back along said measuring path, and light receiving means for receiving the retroreflected beam, a beam divider comprising a beam dividing plate having spaced apart lower and upper edges and being set at an oblique angle to said beam of light from said light transmitting means so as to pass said beam along said measuring path and to deflect the retroreflected beam downward therefrom to said light receiving means positioned therebelow; a first protective transparent plate extending upward from said lower edge through said beam of light and substantially perpendicular thereto; a second protective plate extending from said upper edge to said first protective plate at a position on the opposite side of said beam of light from said lower edge; and wall means interconnecting said first and second protective plates and said beam divider to define a closed internal space therebetween.

4,561,723

ELECTRONIC STEREOSCOPIC VIEWING DEVICE

Nobuo Hamano, and Kazumi Matsumoto, both of Tokyo, Japan, assignors to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Apr. 27, 1983, Ser. No. 489,246
Claims priority, application Japan, Apr. 28, 1982, 57-61075[U]
Int. Cl.[4] G02F 1/13; G02B 27/22
U.S. Cl. 350—331 R 26 Claims



1. A stereoscopic viewing device which comprises:
an electronic signal generating means, said signal generating means producing an electronic signal;
an electronically driven liquid crystal display, said liquid crystal display electronically connected to said signal generating means so as to electronically receive said electronic signal from said generating means and in response to receipt of said electronic signal from said generating means said liquid crystal display visibly displaying parallactically displaced first and second views of an image;
an exposure means for exposing said liquid crystal display to visible light such that said liquid crystal display is illuminated by said visible light and said images are formed by said light transmitted through said liquid crystal display;
a first and a second non-polarizing visible image conducting means each optically connected to said display means so as said first image conducting means optically receives said first view of said image and second image conducting means optically receives said second view of said image;
said first image conducting means including a left eye viewing port, said second image conducting means including a right eye viewing port;
said first image conducting means optically conducting said first view of said image to said left eye viewing port for visual perception of said first view of said image by the left eye of an observer, said second image conducting means optically conducting said second view of said image to said right eye viewing port for visual perception of said second view of said image by the right eye of said observer, said first and said second image conducting means optically insulated with respect to one another so as to restrict optical transfer to said first and said second views of said image between said first optical conducting means and said second optical conducting means.

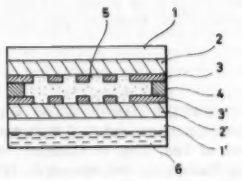
15. A stereoscopic viewing device which comprises:
an electronic signal generating means, said signal generating means producing an electronic signal;
an electronically driven liquid crystal display, said liquid crystal display electronically connected to said signal generating means so as to electronically receive said electronic signal from said generating means and in response to receipt of said electronic signal from said generating means said liquid crystal display visibly displaying parallactically displaced first and second views of an image;
an exposure means for exposing said liquid crystal display to visible light such that said liquid crystal display is illuminated by said visible light and said images are formed by said light transmitted through said liquid crystal display;
a first and a second non-polarizing visible image conducting means each optically connected to said display means so as said first image conducting means optically receives said first view of said image and second image conducting means optically receives said second view of said image;
said first image conducting means including a left eye viewing port, said second image conducting means including a right eye viewing port;
said first image conducting means optically conducting said first view of said image to said left eye viewing port for visual perception of said first view of said image by the left eye of an observer, said second image conducting means optically conducting said second view of said image to said right eye viewing port for visual perception of said second view of said image by the right eye of said observer, said first and said second image conducting means optically insulated with respect to one another so as to restrict optical transfer of said first and said second views of said image between said first optical conducting means and said second optical conducting means;
said first and said second image conducting means are located in association with said liquid crystal display with said liquid crystal display being located between said exposure means and said first and said second image conducting means such that said first and said second image conducting means receive said light transmitted by said liquid crystal display;
a colored transparency sheet positioned in association with said liquid crystal display such that light transmitted by said liquid crystal display is colored by said transparency sheet.

4,561,724

LIQUID CRYSTAL DISPLAY CELL WITH IMPROVED PLASTIC SUBSTRATES

Toshihiro Otaki; Ryuichi Nagata, and Toshiya Yoshii, all of Ohtsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Nov. 21, 1983, Ser. No. 554,030
Claims priority, application Japan, Nov. 25, 1982, 57-206407
Int. Cl.[4] G02F 1/13
U.S. Cl. 350—334 24 Claims



1. A liquid crystal display cell comprising a pair of facing plastic films, a pair of transparent electrodes, each said electrode being formed on the facing surfaces of said films, a liquid crystal enclosed between said films, and a pair of polarizing films, each being provided on the opposite surface of said plastic film, said plastic film comprising a polyester film containing at least 95 mole percent of polyethylene terephthalate, said film having a density of 1.380–1.420 g/cm^3 and three-way refractive indexes within the following range:

$$-0.03 \leqq (n_1+n_3)/2-n_2 \leqq +0.05, \text{ and}$$
$$1.480 \leqq n_3 \leqq 1.525$$

wherein

n_1 = refractive index in the principal oriented direction;

n_2 = refractive index in the direction intersecting perpendicularly to n_1 and n_3; and

n_3 = refractive index in the direction of film thickness.

4,561,725

ELECTRO-OPTICAL DEVICE HAVING HOMOGENEOUS ALIGNMENT LAYER HARDENED WITH CROSS-LINKING AGENTS

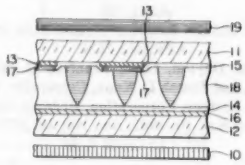
Yoshio Hotta, Atsui, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 6, 1984, Ser. No. 577,210

Claims priority, application Japan, Feb. 9, 1983, 58-20787; Feb. 14, 1983, 58-23471; Apr. 5, 1983, 58-60268

Int. Cl.⁴ G02F *1/13*

U.S. Cl. 350—341 **17 Claims**



1. An electro-optical device comprising a liquid crystal layer sandwiched between two electrode plates, wherein at least one of said electrode plates has a film of a resin hardened in the presence of a cross linking agent on its surface and said film is subjected to aligning treatment.

4,561,726

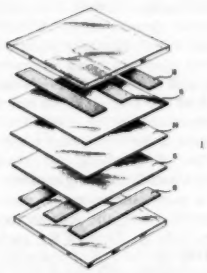
ALIGNMENT OF FERROELECTRIC LCDS

John W. Goodby, Berkeley Heights; Thomas M. Leslie, Lebanon, and Jayantilal S. Patel, Scotch Plains, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 29, 1983, Ser. No. 518,640

Int. Cl.⁴ G02F *1/13, 1/135*

U.S. Cl. 350—341 **18 Claims**



1. A device for affecting incident electromagnetic radiation comprising a liquid crystal material, an ordering material, and a means for producing an electric field characterized in that said ordering material contacts said liquid crystal material in a region where at least a portion of said electromagnetic radiation is to be affected by subjecting said region to an electric field through said means for producing an electric field and wherein said ordering substance comprises a polymer that has an average molecular weight of at least 8,000 atomic units, that is linear, that has substituents that occupy less than 20 percent of the volume occupied by said polymer, that is capable in bulk of being elongated more than 50 percent, and that in bulk after an elongation of at least 50 percent retains a length that is at least 20 percent greater than the original length before elongation wherein said polymer comprises a member chosen from the group consisting of nylons and polyethylenes.

7. A device for affecting incident electromagnetic radiation comprising a liquid crystal material, an ordering material, and a means for producing an electric field characterized in that said ordering material contacts said liquid crystal material in a region where at least a portion of said electromagnetic radiation is to be affected by subjecting said region to an electric field through said means for producing an electric field and wherein said ordering substance comprises a polymer that has an average molecular weight of at least 8,000 atomic units, that is linear, that has substituents that occupy less than 20 percent of the volume occupied by said polymer, that is capable in bulk of being elongated more than 50 percent, and that in bulk after an elongation of at least 50 percent retains a length that is at least 20 percent greater than the original length before elongation wherein said liquid crystal comprises a ferroelectric material.

4,561,727

TWO-DIMENSIONAL ACOUSTO-OPTIC DEFLECTION ARRANGEMENT

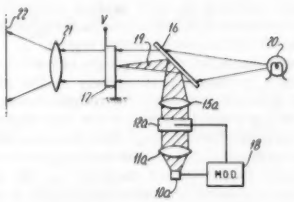
John S. Heeks, Old Harlow, and Roger E. Cooke, Stortford, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 23, 1983, Ser. No. 554,737

Claims priority, application United Kingdom, Nov. 26, 1982, 8233768

Int. Cl.⁴ G02F *1/13*

U.S. Cl. 350—351 **2 Claims**



1. A two-dimensional acousto-optic deflection arrangement including a laser for providing a source of electromagnetic radiation, means for modulating the source, means for collimating the output of the source into a beam, an acousto-optic deflection means situated in the path of said beam, the deflection means comprising a rectangular body of acousto-optic material provided on two adjacent surfaces with electro-acoustic transducers arranged to launch orthogonal bulk acoustic waves into the material transverse to the direction of propagation of radiation through the material whereby the collimated radiation can be scanned in two dimensions over a predetermined area, a source of secondary illumination arranged to illuminate said predetermined area, and a thermo-optically addressable liquid crystal display device positioned so as to be scannable by the deflected focussed radiation and illuminated by said source of secondary illumination and wherein the source of electromagnetic radiation and the source of secondary illumination are disposed with their outputs orthogonal to one another, the arrangement including mirror means for combining the outputs arranged to deflect one of said outputs to be colinear with the other output; and wherein said source of electromagnetic radiation is a GaAlAs laser.

4,561,728

ELECTROOPTICAL COMPARATORS

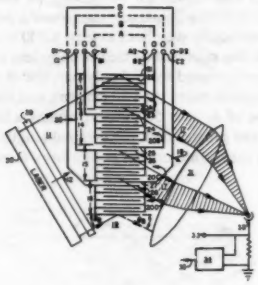
Richard P. Kenan, Upper Arlington, and Carl M. Verber, Columbus, both of Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

Filed Jan. 29, 1982, Ser. No. 344,116

The portion of the term of this patent subsequent to Oct. 1, 2002, has been disclaimed.

Int. Cl.⁴ G02F *1/03*

U.S. Cl. 350—356 **22 Claims**



1. Apparatus for receiving light entering in a predetermined input direction therein and controlling the directions in which portions of the light travel through regions thereof so as to emerge therefrom in a selected output direction with intensity responsive to a plurality of electrical potential differences, comprising

an electrooptic waveguide,

a plurality of electrooptic reflective means, each comprising a pair of electrodes, with each reflective means on a different region in the waveguide, for forming a separate Bragg grating in each region positioned with a direction of Bragg incidence in each grating approximately in the predetermined input direction, each region being adjacent to and in tandem with another region,

light input means for directing light of known or controlled intensity to enter approximately in the predetermined input direction into each electrooptic means,

a plurality of control means, one for each region, each comprising means for applying a first electrical potential to the first electrode and means for applying a second electrical potential to the second electrode of the electrooptical reflective means in the individual region, to further direct a portion of the light entering into the individual region by providing a Bragg reflection thereof beyond the region in the selected output direction, and

output means for receiving the light travelling beyond each region in the selected output direction.

4,561,729

COUNTERELECTRODE FOR AN ELECTROCHROMIC INDICATING DEVICE

Jutta Heinz, Gerlingen; Helmut Sautter, Ditzingen; Rainer Schink, Leonberg, and Lothar Weber, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

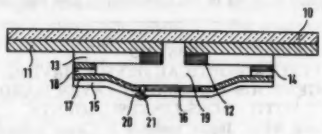
Filed Mar. 25, 1983, Ser. No. 478,271

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1982, 3211637

Int. Cl.⁴ G02F *1/17*

U.S. Cl. 350—357 **11 Claims**

1. Electrochromic indicating device having first and second substrates adjacent to but spaced from each other, said first substrate being transparent or translucent and having on its inner side a transparent electrically conductive layer and an electrode lying thereon which is composed essentially of a layer of an oxide of a transition metal, said second substrate being provided with a counterelectrode, there being an electrolyte interposed between said electrode and said counterelectrode, said counterelectrode (16) in accordance with the invention, being constituted of a mixture consisting of activated carbon and an organic binder and hardened with preservation, to a great extent, of the high magnitude of internal surface of the activated carbon.



4,561,730

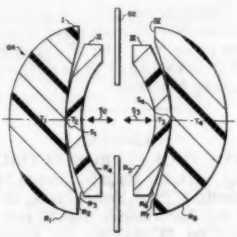
SYNTHETIC RESIN LENS SYSTEM FOR IMAGING APPARATUS

John A. Lawson, Dayton, Ohio; Manfred R. Kuehnle, New London, N.H., and Joseph D. Knox, Centerville, Ohio, assignors to Coulter Systems Corporation, Bedford, Mass.

Filed Sep. 30, 1982, Ser. No. 431,577

Int. Cl.⁴ G02B *9/36*

U.S. Cl. 350—432 **21 Claims**



1. A lens system comprising four airspaced elements arranged in two pairs symmetrically arranged on opposite sides of a central space, the elements being arranged along the optical axis as a first positive element I, a second negative element II, a third negative element III and a fourth positive element IV, the first and fourth elements being symmetrical and the second and third elements being symmetrical, the four elements being formed of plastic materials having low indices of refraction, each of the four elements having a surface that is aspheric to compensate for the low index of refraction of the element materials and the lens system providing unitary magnification, being free of vignetting, and providing an aperture of the order of f/5.6 and a field angle of the order of 64°, each element being a meniscus having its concave surface facing toward the central space, the lens surfaces being described respectively, by radii R_1 through R_8, each element having a thickness along the optical axis of, respectively, T_1 through T_4, the distance that the lens elements are spaced apart being described by the spacings S_1 through S_4 with S_2 and S_3 describing the spacings from said central space, the elements having indices of refraction n_d, Abbe numbers V_d, and the lens system having a focal length F, the parameters of said system being

F = 168.46		f/5.6 SPACE AND	F.A. = 64°	
LENS	RADII	THICKNESS	Nd	Vd
I	$R_1 = +33.23$ $R_2 = +82.88$	$T_1 = 17.47$	1.492	57.4
		$S_1 = 0.20$		

-continued

F = 168.46		f/5.6 SPACE AND THICKNESS	F.A. = 64°	
LENS	RADII		Nd	Vd
II	$R_3 = +46.98$	$T_2 = 5.00$	1.585	29.9
	$R_4 = +27.84$			
		$S_2 = 11.88$		
STOP				
		$S_3 = 11.88$		
III	$R_5 = -27.84$	$T_3 = 5.00$	1.585	29.9
	$R_6 = -46.98$	$S_4 = 0.20$		
IV	$R_7 = -82.88$	$T_4 = 17.47$	1.492	57.4
	$R_8 = -33.23$			

the lens surface of element I described by radium R_1 being aspheric, with its equation being:

$$X=\frac{Y^2}{33.23+33.23\sqrt{1-1.149\left[\frac{Y}{33.23}\right]^2}}+AY^4+BY^6+CY^8+DY^{10}$$

where

$A=-1.461\times10^{-8}$,

$B=+3.267\times10^{-10}$,

$C=-3.611\times10^{-13}$,

$D=+3.205\times10^{-16}$,

X represents a distance in the advancing direction of a ray on the optical axis, and

Y represents a distance in the direction perpendicular to the X direction;

the lens surface of element II described by radium R_4 being also aspheric, with its equation being:

$$X=\frac{Y^2}{27.84+27.84\sqrt{1-1.718\left[\frac{Y}{27.84}\right]^2}}+AY^4+BY^6+CY^8+DY^{10}$$

where:

$A=-8.482\times10^{-7}$,

$B=-2.176\times10^{-10}$,

$C=-2.693\times10^{-12}$,

$D=+1.156\times10^{-15}$,

X represents a distance in the advancing direction of a ray on the optical axis, and

Y represents a distance in the direction perpendicular to the X direction;

the surfaces described by radii R_4 and R_5 are mirror images of one another and the surfaces described by radii R_1 and R_8 being mirror images of one another, and

lens elements I and IV being made of an acrylic material, specifically, polymethylmethacrylate, while elements II and III being made of a polycarbonate material.

4,561,731

ELECTRONIC ILLUMINATION CONTROL

Victor B. Kley, 1119 Park Hill Rd., Berkeley, Calif. 94708

Continuation-in-part of Ser. No. 319,993, Nov. 9, 1981, abandoned, which is a continuation-in-part of Ser. No. 128,891, Mar. 10, 1980, abandoned. This application Aug. 24, 1984, Ser. No. 644,116

Int. Cl.⁴ G02B *21/20, 21/08;* G02F *1/13*

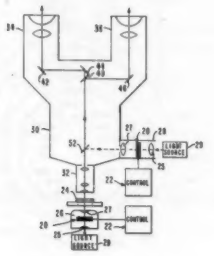
U.S. Cl. 350—510 **78 Claims**

1. An illumination apparatus for a viewing system having an object station for receiving an object to be viewed comprising a light source,

condenser lens means for directing light from the light source in a cone of light toward the object station,

an electrically controlled light transmission unit in the path of light from the light source through the condenser lens means,

said electrically controlled light transmission unit including a layer of electro-optic material extending in a plane transverse to the path of light, and transparent electrode means disposed on opposite sides of the layer of electro-optic material for defining a plurality of different patterns for exciting the electro-optic material, and



electrical control means for selectively applying voltages to the electrode means of the light transmission unit to selectively excite the different patterns and the corresponding portions of the layer of electro-optic material to alter light conditions in selected portions of the cone of light.

4,561,732

DRIVING MIRROR FOR MOTOR VEHICLES

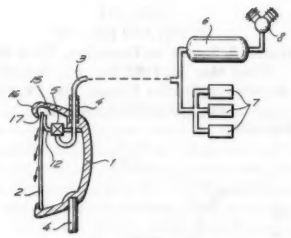
Manfred Japes, Ginsheim-Gustavsburg, Fed. Rep. of Germany, assignor to MAN Maschinenfabrik Augsburg-Nurnberg AG, Munich, Fed. Rep. of Germany

Filed Aug. 31, 1983, Ser. No. 527,968

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1982, 3234843

Int. Cl.⁴ B60S *1/60;* B60R *1/12*

U.S. Cl. 350—584 **1 Claim**



1. A driving mirror for a motor vehicle, comprising:

a mirror housing having an upper beaded edge,

an intermediate web within the housing defining, together with the upper part of the housing, a compressed air chamber,

an air feed line for bringing compressed air to the chamber,

a valve mounted on the web for controlling the flow of compressed air from the feed line into the chamber, and

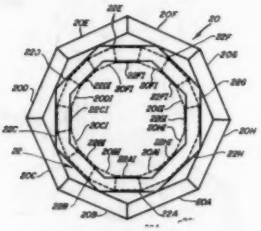
a mirror pane mounted within the housing, the upper portion of the mirror pane being secured to the web in a position so that its outer face is spaced from the beaded edge of the housing so as to define a slot-like nozzle between the beaded edge and the mirror pane, the nozzle communicating with the compressed air chamber and being shaped to direct compressed air from the chamber tangentially over the outer face of the mirror.

4,561,733

PANORAMIC UNITY VISION SYSTEM

Cody B. Kreischer, Palatine, Ill., assignor to Recon/Optical, Inc., Barrington, Ill.

Filed Apr. 17, 1984, Ser. No. 601,387
Int. Cl.⁴ G02B *23/02, 5/08*
U.S. Cl. 350—618 **15 Claims**



1. A viewing system which provides for a substantially continuous and unobstructed horizontal field of view over a desired viewing angle which comprises:

a plurality of entrance reflecting surfaces arranged in circumferential relationship, each of which functions to reflect from a fixed reference point a field of view which overlaps the field of view of an adjacent entrance reflecting surface,

a plurality of exit reflecting surfaces aligned with and spaced from each of said first reflecting surfaces for receiving a reflected view therefrom and for reflecting the view to an observer,

the number and width of said entrance reflecting surfaces being such that the sum of all of the angles in azimuth as projected on a horizontal plane subtended by each of the said entrance reflecting surfaces as measured from a fixed reference point exceeds the angle in azimuth subtended by the system as a whole, and

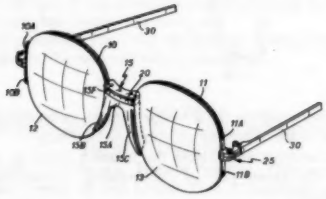
means for retaining said entrance and exit reflecting surfaces in fixed relationship.

4,561,734

EYEGLASS FRAME

Charles Ayache, 5, Square du Trocadéro, 75116 Paris, France

Filed May 24, 1982, Ser. No. 381,393
Claims priority, application France, May 29, 1981, 81 10686
Int. Cl.⁴ G02C *1/04, 5/00*
U.S. Cl. 351—103 **17 Claims**



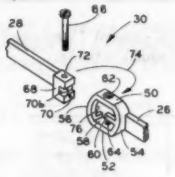
1. An eyeglass frame comprising rims for receiving lenses, said rims comprising flexible tie members adapted to conform to the contour of the respective lenses, a bridge member extending between adjacent portions of the respective rims, temple members in the temple zones remote from said bridge member, each of said flexible tie members being attached to said bridge member and one of said temple members and extending along the major part of the periphery of associated lens for holding same, means for tensioning each of said tie members being provided on an associated one of said bridge and temple members for urging said bridge member and said temple members to bear firmly against the lenses, whereby said bridge member, the lenses and said temple members are held in a stable, stationary position relative to one another when said tie members are tightened.

4,561,735

EYEGLASS FRAME HINGE

Barton M. Levoy, 130 Cutter Mill Rd., Great Neck, N.Y. 11022

Filed May 4, 1984, Ser. No. 607,176
Int. Cl.⁴ G02C *5/22, 5/14*
U.S. Cl. 351—153 **3 Claims**



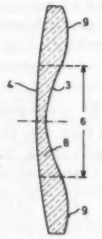
1. An improved hinge for pivotally interconnecting a temple piece to an eyeglass frame comprising for each hinge a first rectangular hinge member having a top, a bottom and opposide side legs bounding a rectangular compartment, a second hinge member having adjacent one end a laterally extending trunion block sized to be projected within said rectangular compartment, a hinge pin having an operative position disposed vertically through said first hinge member top and bottom and said second hinge member trunion block so as to mount said second hinge member to partake of pivotal traverses about said hinge pin, and a cooperating notch in said second hinge member trunion block in aligning relation to receive therein a projection into said compartment of one of said side legs of said first hinge member, whereby such interfitting notch and projection contribute to supporting said second hinge member during the pivotal traverses thereof.

4,561,736

EYEGLASS LENSES FOR PERSONS SUFFERING FROM SEVERE AMETROPIA

Gerhard Fürter, Aalen, and Hans Lahres, Aalen-Wasseralfingen, both of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim on the Brenz, Fed. Rep. of Germany

Filed Jul. 29, 1983, Ser. No. 518,380
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1982, 3229577
Int. Cl.⁴ G02B *3/04;* **G02C** *7/02*
U.S. Cl. 351—159 **8 Claims**



1. An ophthalmic lens for persons suffering from severe ametropia, said lens having:

(a) a convex object-side front surface and an eye-side rear surface;

(b) said rear surface consisting of:

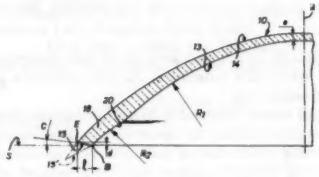
(c) a central region;

(d) a surrounding outer region; and
(e) a transition region between said central region and said outer region;
(f) said central region being developed as a surface chosen from the group consisting of aspherically developed surfaces of revolution and atorically developed surfaces, for optimal correction of aberrations;
(g) said central region having a diameter such that it provides a wearer with an object-side viewing angle of at least 20 degrees;
(h) said transition region having a rear surface of such curvature that the entire rear surface of said lens, including said central region and said outer region and said transition region, is continuously differentiable twice, in the sense that the second derivative of the curvature is a continuous function without steps, and the rear surface, in radial cross section, forms a smooth curve without any abrupt change in curvature.

4,561,737
CONTACT LENS

Claude Bourset, Creteil, and Georges Wajs, Ivry, both of France, assignors to Essilor International "Cie Generale d'Optique", Creteil Cedex, France

Filed Apr. 8, 1982, Ser. No. 366,656
Claims priority, application France, Apr. 15, 1981, 81 07550
Int. Cl.⁴ G02C *7/04*
U.S. Cl. 351—160 R **15 Claims**



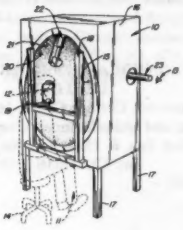
1. A contact lens, particularly but not exclusively a flexible contact lens, comprising an inner surface, an outer surface, and a peripheral edge surface extending between said outer and inner surfaces, said peripheral edge surface lying wholly forwardly of a reference surface which extends in a generally transverse direction relative to the axis of said lens through a circle at the juncture of said inner surface and said peripheral edge surface, said peripheral edge surface extending generally obliquely and forwardly relative to said reference surface from said inner surface to said outer surface.

4,561,738
FIELD TESTER

William E. Humphrey, San Leandro, and Charles Campbell, Berkeley, both of Calif., assignors to Humphrey Instruments, Inc., San Leandro, Calif.

Filed Oct. 26, 1982, Ser. No. 436,876
Int. Cl.⁴ A61B *3/02*
U.S. Cl. 351—226 **17 Claims**

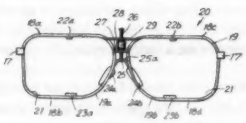
1. An off-center projection system for a hemispheric projection surface, comprising:
a light source;
means for collimating light from said light source;
a movable apertured member within a path of said collimated light;
telescopic optics within said collimated light path for projecting an image of said aperture onto said projection surface; and
means for moving said apertured member wherein said projected image size and intensity remains constant, according to selected image criteria, despite a constantly changing distance between a point of projection and a point on said projection surface where said image is formed.

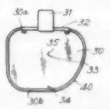


4,561,739
TRIAL SPECTACLES

Sakiho Okazaki, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Continuation of Ser. No. 402,887, Jul. 29, 1982, abandoned. This application Jun. 3, 1985, Ser. No. 740,311
Claims priority, application Japan, Jul. 31, 1981, 56-121128
Int. Cl.⁴ A61B *3/04*
U.S. Cl. 351—227 **8 Claims**





1. A pair of trial spectacles comprising a frame member adapted to be supported on the face of a wearer having a first rim portion positioned in front of one of the eyes of the wearer and a second rim portion, said frame member including bridge means for fixedly coupling said first rim portion to said second rim portion, said second rim portion being positioned in front of the other eye of the wearer when said frame member is supported on the face of the wearer, a first lens slidably, removably supported in said first rim portion, said first lens being horizontally slidable in said first rim portion so that said first lens can be horizontally adjusted to meet the wearer's visual requirements, a second lens slidably, removably supported in said second rim portion, said second lens being horizontally slidable in said second rim portion so that said second lens can be horizontally adjusted to meet the wearer's visual requirements, said first and second lenses each including an upper portion and a lower portion essentially parallel to said upper portion, said first and second rim portions each including an upper portion and a lower portion essentially parallel to said upper portion, said first and second lenses being horizontally slidable between the respective upper and lower portions of said first and second rim portions, respectively, said first and second lenses having a smaller transverse width than the respective widths of said first and second rim portions to permit horizontal sliding adjustment of said first and second lenses in

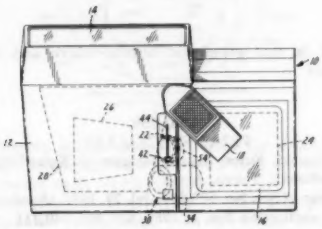
said first and second rim portions, respectively, said first and second lenses each having a longitudinal length essentially equal to the distance between the upper and lower portions of said first and second rim portions, respectively.

4,561,740

DUAL-MAGNIFICATION REAR PROJECTION LECTERN

Dennis F. Vanderwerf, Cottage Grove, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 6, 1984, Ser. No. 617,631
Int. Cl.⁴ G03B *3/00*
U.S. Cl. 353—101 **6 Claims**



1. In a dual magnification rear screen projector which successively includes along a folded light path a light source, an object stage, a condensing lens, a projection lens, and a rear projection screen upon which an image of an object located on said object stage may be projected for viewing from the side of the screen opposite said light source, the improvement which comprises:

a first auxiliary lens movable between positions out of said light path and in said light path between said condensing lens and said projection lens;

a second auxiliary lens movable with said first auxiliary lens between positions out of said light path and in said light path between said projection lens and said rear projection screen;

means for simultaneously moving said first and second auxiliary lenses between said positions out of and into said light path;

said projector providing a first magnification of said object when said first and second auxiliary lenses are out of said light path and a second magnification of said object when said first and second auxiliary lenses are in said light path; and

wherein said projector is parfocal in that axial movement of said projection lens is not required for focusing said image at said projection screen in response to movement of said first and second auxiliary lenses to achieve said first or second magnifications.

4,561,741

CAMERA FILM FEED CONTROL APPARATUS

Sunao Ishizaka, and Osamu Maida, both of Tokyo, Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Aug. 1, 1984, Ser. No. 636,553
Claims priority, application Japan, Aug. 10, 1983, 58-145071
Int. Cl.⁴ G03B *1/60, 17/36*
U.S. Cl. 354—21 **8 Claims**

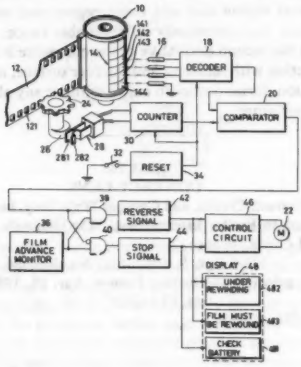
1. In a camera in which a cartridge, on which information representing a nominal number of exposures of a film roll in the cartridge is formed, can be used, and feed means for winding one frame of said film roll upon each exposure by means of an electric motor is provided, an apparatus for controlling said feed means, comprising:

(a) detecting means for detecting said information on said cartridge;

(b) counting means for counting the number of the frames of said film roll wound by said feed means;

(c) comparing means for generating a comparison output signal when the number of the frames counted by said counting means exceeds said nominal number of the exposures included in said information detected by said detecting means;

(d) monitor means for monitoring a wind state of said film roll wound by said feed means, and for generating a detection output signal upon detecting an abnormal wind state, said monitor means monitoring a current which flows to



said electric motor and generating said detection output signal when said monitored current exceeds a predetermined value; and

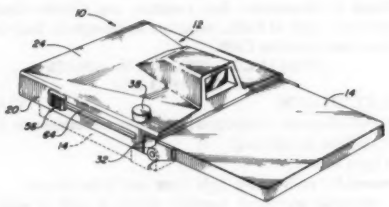
(e) control means responsive to said comparing means and said monitor means for generating a first output signal instructing rewinding of said film roll in said cartridge when said detection output signal is generated while said comparison output signal is generated and for generating a second output signal instructing stopping of rotation of said electric motor when said detection output signal is generated while said comparison output signal is not generated.

4,561,742

DISK CAMERA USING SINGLE FORMAT FILM UNIT HAVING MULTIPLE IMAGES

Joseph A. Stella, Peabody, and Joseph B. Wright, Marblehead, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 4, 1984, Ser. No. 646,762
Int. Cl.⁴ G03B *17/52*
U.S. Cl. 354—86 **5 Claims**



1. Photographic apparatus comprising:

a first camera housing section;

a second housing section coupled to said first housing section for movement between open and closed conditions;

said first camera housing section including means defining a

film chamber; means for optically directing image forming scene light to a focal plane in said film chamber, means being operable for unblocking and blocking scene light travelling to the focal plane so as to define an exposure interval at the focal plane, means for mounting for movement in said compartment a single format film assembly of the instant developing type upon which several spaced images can be exposed for movement in said compartment; means for incrementing said mounting means relative to the focal plane so that successive sections on the single film assembly are exposed; means for effecting processing of all the images on said film assembly, and said housing having an exit slot allowing discharge of the film assembly passes said rollers;

said second housing section including an imbibing chamber, said second housing section when moved to the closed condition has said imbibing chamber in operative communication with said exit slot for receiving therein the discharged film assembly, and when moved to the open condition has said imbibing chamber accessible so that the film assembly can be removed therefrom.

4,561,743
DISC CAMERA DRIVE

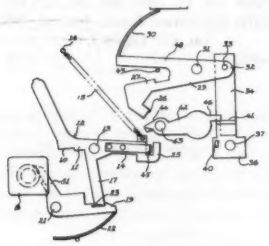
Lee Benson, Hong Kong, Hong Kong, assignor to Overseas Promotions Ltd., Wanchai, Hong Kong

Filed Jun. 4, 1984, Ser. No. 617,247

Claims priority, application United Kingdom, Jun. 9, 1983, 8315893

Int. Cl.⁴ G03B *1/00*

U.S. Cl. 354—121 **8 Claims**



1. A disc camera drive which comprises a manually movable film advance member reciprocable between a rest and an actuated position, and a manually movable shutter release element; spring means; a shutter; and drive means including a first pivoted lever actuated by the film advance member on its movement to its actuated position to rotate the disc film and activate the spring means; spring retainer means to retain the spring means in activated position and release the spring means to operate the shutter on actuation of the shutter release element; a second pivoted lever pivotal in the same plane as the first pivoted lever; and a cam mechanism operating a spring urged detent for selectively engaging the disc film to lock it against advance, wherein the first pivoted lever, upon release of the spring means, operates the shutter and engages an arm of the second pivoted lever, the other arm of which is coupled to the cam mechanism whereby the detent element is urged against the film during the latter part of its advance so as to engage a film detent opening when the latter comes into register, and the detent element is withdrawn from the opening after the shutter is operated.

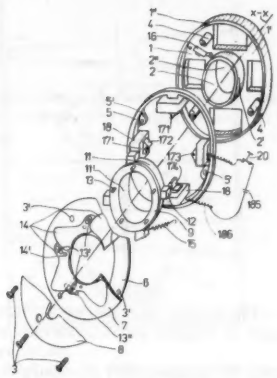
4,561,744
ELECTROMAGNETICALLY OPERATED LEAF SHUTTER

Peter Rietbrock, 32, Otto-Grotewohl-Strasse, 6902 Jena-Lobeda, District of Gera, and Gerhard Knapke, 4, Vorwerksgasse, 5300 Weimar, both of German Democratic Rep.

Filed Nov. 19, 1984, Ser. No. 673,061

Int. Cl.⁴ G03B *9/08*

U.S. Cl. 354—234.1 **4 Claims**



1. An electromagnetically operated leaf shutter, particularly for use in cameras installed in microscopes comprising about an optical axis

a tubular shutter housing having a rear face, and a housing wall, a socket, being attached to said rear face, and having a wall in spaced and concentrical relation to said tubular housing wall,

said socket providing for a light passage in said rear face,

an annular armature being seated for rotation via an internal face on the socket wall,

said armature being provided with an even number of poles on an external face

an annular field ring being secured to said housing and encompassing said armature,

said annular field ring being provided with an even number of pole-shoes projecting towards said optical axis, said pole-shoes being each provided with a magnet coil,

the number of pole-shoes and the number of poles being equal and satisfying the condition 2n, where n=1, 2, 3 . . . , each of said pole-shoes being associated to an adjacent one of said poles,

said pole-shoes and said poles having each an abutting face in parallel to one another when substantially in contact,

said pole-shoes being of wedge-shape towards said optical axis,

means for energizing said magnet coils,

shutter blades being operationally connected to said armature and serving for opening and closing said light passage,

said abutting faces of said pole-shoes defining a first end position for said armature when rotated,

means for defining a second end position for said poles of said armature when rotated,

means for returning said armature to said second end position,

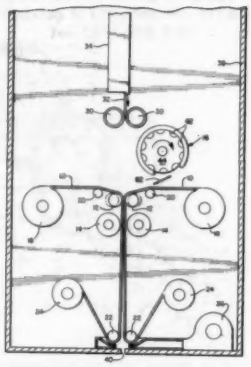
said annular field ring being for rotating said armature into said first end-position when said magnet coils being in an energized state,

means for protecting said shutter blades against an electromagnetic field.

4,561,745
METHOD AND APPARATUS FOR PROCESSING BOTH SIDES OF DISCRETE SHEETS

Gordon F. Kinsman, Billerica; Ronald F. Lambert, Wayland, and David A. Morrison, Framingham, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 28, 1983, Ser. No. 566,313
Int. Cl.⁴ G03D *5/06*
U.S. Cl. 354—299 **13 Claims**



1. Apparatus for simultaneously processing both sides of a film sheet of given length, comprising:

a pair of carrier webs;

means for defining a nip through the carrier webs pass in facing relation;

means for dispensing processing material onto the facing surfaces of the carrier webs in the nip; and

advancing means for advancing the carrier webs in one direction to an through the nip to bring the facing surfaces of the webs together at the nip and the spread processing material over a length of the webs at least equal to the given length of the film sheet, for then advancing the webs in the opposite direction back through the nip to retract and separate the lengths of the webs carrying processing material, and for then feeding the film sheet between the webs and again advancing the webs in the one direction through the nip to sandwich the film sheet within the length of the webs carrying processing material.

4,561,746
FOCUS DETECTION DEVICE AND AUTOMATIC FOCUSING DEVICE FOR CAMERA

Motonobu Matsuda, and Masatoshi Ito, both of Sakai, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jun. 12, 1984, Ser. No. 619,882
Claims priority, application Japan, Jun. 15, 1983, 58-108395
Int. Cl.⁴ G03B *3/00*
U.S. Cl. 354—400 **22 Claims**

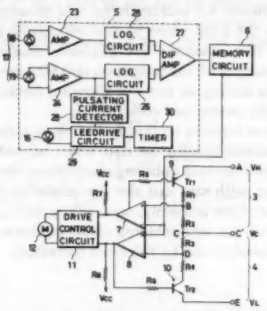
1. A focus detection device comprising:

an objective lens adjustable for focusing;

a focus condition signal generating means for generating a focus condition signal which varies with the amount and direction of the adjustment required for said objective lens to focus on a target object;

a reference signal generating means for generating first to third reference signals, said first and second reference signals being larger and smaller than said third reference signal by a predetermined value, respectively;

a focus condition determining means switchable between a first operation mode for comparing said focus condition signal with said third reference signal and a second operation mode for comparing said focus condition signal with said first and second reference signals, said focus condition determining means being adapted to determine that said objective lens is in an in-focus condition with respect to the target object, with said focus condition signal reaching said third reference signal in said first operation mode, and with said focus condition signal remaining within the range between said first and second reference signals in said second operation mode, respectively; and

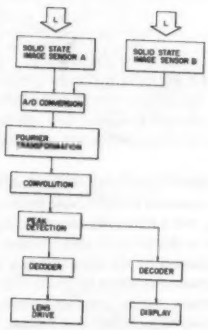


a switching means for switching said focus condition determining means from said first operation mode to said second operation mode when said focus condition determining means in said first operation mode has determined that said objective lens is in an in-focus condition with respect to the target object.

4,561,747
AUTO-FOCUSING METHOD

Yoshimi Ohno, Kawasaki, and Ikuya Tsurukawa, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 14, 1984, Ser. No. 620,707
Claims priority, application Japan, Jun. 30, 1983, 58-118922
Int. Cl.⁴ G03B *3/00*
U.S. Cl. 354—402 **5 Claims**



1. A method of carrying out auto-focusing by displacing a lens along the direction of an optical axis of said lens in accordance with a correlation between outputs from a pair of solid-state image sensors, said method comprising the steps of:

passing light through said lens and impinging the light passed through said lens on both of said solid-state image sensors;

scanning each of said pair of solid-state image sensors thereby producing respective outputs A(n) and B(n);

converting said outputs A(n) and B(n) into digital data A'(n) and B'(n);

calculating Fourier transforms $F_1(u)$, $F_2(u)$, $G_1(u)$ and $G_2(u)$ using the following equations,

$$F_1(u) = \sum_{n=1}^{N} 2 \times \frac{1}{N} \times A'(n) \times \cos\left(2\pi \times \frac{1}{N} \times u \times N\right)$$

$$F_2(u) = \sum_{n=1}^{N} 2 \times \frac{1}{N} \times A'(n) \times \sin\left(2\pi \times \frac{1}{N} \times u \times n\right)$$

$$G_1(u) = \sum_{n=1}^{N} 2 \times \frac{1}{N} \times B'(n) \times \cos\left(2\pi \times \frac{1}{N} \times u \times n\right)$$

$$G_2(u) = \sum_{n=1}^{N} 2 \times \frac{1}{N} \times B'(n) \times \sin\left(2\pi \times \frac{1}{N} \times u \times n\right)$$

where N is the number of photoelectric elements in each of said pair of solid-state image sensors, u=0, 1, 2, . . . , M, and M is an integer which is equal to or smaller than (N/2)−1;

calculating the following values F_0, G_0, F(u) and G(u) from said $F_1(u)$, $F_2(u)$, $G_1(u)$ and $G_2(u)$,

$$F_0 = \sum_{u=1}^{M} [\{F_1(u)\}^2 + \{F_2(u)\}^2]$$

$$G_0 = \sum_{u=1}^{M} [\{G_1(u)\}^2 + \{G_2(u)\}^2]$$

$$F(u) = (F_1(u) \times G_1(u) + F_2(u) \times G_2(u))$$

$$G(u) = (F_2(u) \times G_1(u) - F_1(u) \times G_2(u));$$

calculating the following value f*g, using said F_0, G_0, F(u) and G(u), in a timed sequence at a predetermined time period for variable t,

$$f*g = \frac{2}{F_0 + G_0} \times \left(\sum_{u=1}^{M} F(u)\cos(ut) + G(u)\sin(ut)\right) ; \text{ and}$$

determining an amount of displacement of said lens in accordance with a value of said variable t which gives a maximum value for said f*g, whereby if said amount of displacement thus determined is outside of a predetermined range, said lens is displaced to an in-focus position according to said amount of displacement thus determined.

4,561,748

FOCUS DETECTION DEVICE

Takanobu Omaki, Sennan; Akiyoshi Nakamura; Masato Ishida, both of Sakai, and Shuzo Matsushita, Ikeda, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 16, 1984, Ser. No. 610,676

Claims priority, application Japan, May 20, 1983, 58-89717; May 20, 1983, 58-89716

Int. Cl.⁴ G03B *3/00*

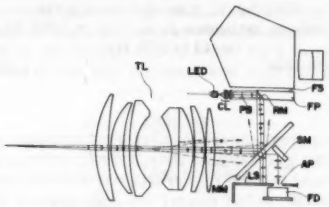
U.S. Cl. 354—403 **13 Claims**

1. A focus detecting device for use in a camera having an objective lens, comprising:

means for emitting light which includes first and second linear polarization components arranged perpendicular to each other;

means for selecting said first linear polarization component to project it towards an object to be photographed through said objective lens;

means for receiving light which has been reflected from said object and passed through said objective lens, said receiving means receiving the light which includes only a second linear polarization component perpendicular to said first linear polarization component; and



means for detecting a focusing condition of said objective lens in accordance with the light received on said receiving means.

4,561,749

FOCUS DETECTION APPARATUS

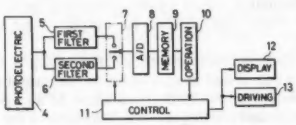
Ken Utagawa, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Jan. 30, 1984, Ser. No. 575,154

Claims priority, application Japan, Feb. 2, 1983, 58-15887; Mar. 3, 1983, 58-35017; May 9, 1983, 58-79414; Aug. 11, 1983, 58-147142; Sep. 16, 1983, 58-170808

Int. Cl.⁴ C03B *3/00*

U.S. Cl. 354—406 **58 Claims**



10. A focus detection apparatus for detecting a focusing state of an imaging optical system comprising:

(1) first and second photoelectric element arrays, each of said arrays including a plurality of photoelectric elements arranged at a pitch Po;

(2) optical means for forming first a image of an object on said first array and forming a second image of said object on said second array, said first array generating a series of first signals which represent said first image, said second array generating a series of second signals which represent said second image;

(3) first filter means for filtering said first and second signals, said first filter means having MTF characteristics with a peak of MTF value being located near a spatial frequency 1/4Po, the MTF value gradually decreasing as spatial frequencies depart from said spatial frequency 1/4Po;

(4) second filter means for filtering said first and second signals, said second filter means having MTF characteristics with MTF values being greater than those of said first filter means in a frequency region lower than about said frequency 1/4Po;

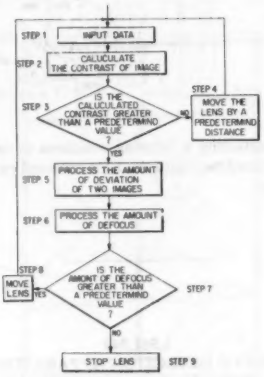
(5) operation means for generating. based on first and second signals filtered by said first filter means, a first output which represents a focusing state of said imaging optical system and for generating, based on first and second signals filtered by said second filter means, a second output which represents said focusing state.

4,561,750

IN-FOCUS STATE DETECTION DEVICE

Susumu Matsumura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 13, 1984, Ser. No. 630,410
Claims priority, application Japan, Jul. 28, 1983, 58-138152
Int. Cl.⁴ G03B *3/10*
U.S. Cl. 354—406 **18 Claims**



1. A device for detecting an in-focus state of an object lens comprising:

optical means for forming a plurality of images having relative positional relationship thereof changed in accordance with a focusing state of the object lens;

said optical means forming the images by light fluxes transmitted through the object lens;

sensing means for sensing said images;

discrimination means for discriminating the focusing state of the object lens based on the output of said sensing means; and

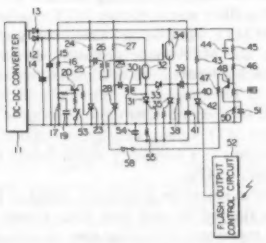
said discrimination means discriminating a contrast of at least one of said images based on the output of said sensing means prior to the discrimination of a correlation of the images and starting the discrimination of the correlation of the images based on the output of said sensing means when the contrast is higher than a predetermined level.

4,561,751

FLASH DEVICE

Nobuyoshi Hagyuda, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Mar. 26, 1984, Ser. No. 593,703
Claims priority, application Japan, Mar. 31, 1983, 58-53492
Int. Cl.⁴ G03B *15/03*
U.S. Cl. 354—418 **14 Claims**



1. An electronic flash device of a camera comprising:

(a) first flash means for emitting a flashlight, said first flash means including a discharge tube for emitting a flashlight and capacitor means for accumulating therein a charge necessary for said discharge tube to emit a flashlight;

(b) second flash means for emitting a flashlight;

(c) means for detecting that said first flash means has started to emit a flashlight and for producing a detection signal, said detecting means including means for detecting a voltage produced in accordance with the charge accumulated in said capacitor means; and

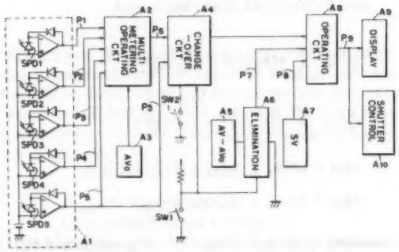
(d) means responsive to said detection signal to cause said second flash means to start to emit a flashlight.

4,561,752

METERING DEVICE OF A CAMERA

Hidenori Miyamoto, Ichikawa, and Takashi Saegusa, Kawasaki, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Jul. 11, 1984, Ser. No. 629,897
Claims priority, application Japan, Jul. 26, 1983, 58-136160
Int. Cl.⁴ G03B *7/08*
U.S. Cl. 354—432 **8 Claims**



1. In a camera provided with an automatic aperture control device for stopping down a stop of a photo-taking lens from its open condition to a predetermined aperture value in response to the photographing operation, a metering device comprising:

(a) first metering means for effecting metering while dividing an object into a plurality of areas through said stop and producing a first metering output which determines the exposure of the object on the basis of a plurality of photoelectric outputs corresponding to said areas;

(b) second metering means for metering the central partial area of said object through said stop and producing a second metering output corresponding to said partial area;

(c) means operable by the operator for manually stopping down the stop of said photo-taking lens which is in its open condition to a preset aperture value independently from said automatic aperture control device; and

(d) change-over means including means responsive to said manually stopping down means and selecting said first metering output when the stop of said photo-taking lens is in its open condition and selecting said second metering output when said stop has been stopped down to said preset aperture value by said manually stopping down means.

4,561,753

SELECTIVE PHOTORESPONSIVE SENSING CIRCUIT

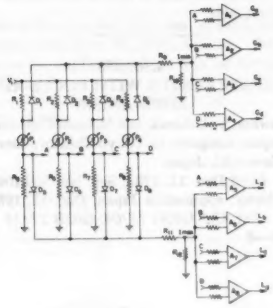
William T. Plummer, Concord, Mass., and Philip G. Baker, Cupertino, Calif., assignors to Polaroid Corporation, Cambridge, Mass.

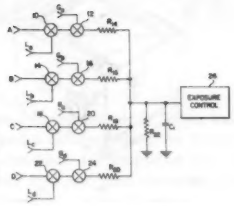
Filed Mar. 13, 1985, Ser. No. 711,176
Int. Cl.⁴ G03B *7/081*; G01J *1/44*
U.S. Cl. 354—432 **19 Claims**

1. A photosensor arrangement for providing an exposure influencing control signal in a photographic apparatus comprises:

a plurality of photoresponsive elements each arranged to have a different select field of view; and

circuit means for providing an output signal for each photoresponsive element corresponding to the scene light intensity detected by that photoresponsive element from its said select field of view and transmitting said output signals for all of said photoresponsive elements excepting the output signals for select photoresponsive elements that detect either the highest or lowest scene light intensities.





4,561,754

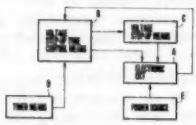
VOLTAGE CONTROL APPARATUS FOR A CAMERA

Shinichi Matsuyama, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 12, 1985, Ser. No. 700,685

Int. Cl.⁴ G03B *7/26*

U.S. Cl. 354—484 **14 Claims**



1. A voltage control apparatus for a camera comprising:

(a) a power source having a voltage value;

(b) a heavy load for changing the voltage value of the power source at the operation of the load;

(c) an electronic circuit responsive to the source for controlling camera functions;

(d) voltage step-up means for stepping up the voltage value of the power source; and

(e) a control means for operating the voltage step-up means when the heavy load is operated and for continuing operation of the voltage step-up means for a predetermined period of time after the heavy load stops operation.

4,561,755

CLEANING DEVICE FOR CLEANING COPY PAPER SEPARATION DEVICE AND TRANSPORT DEVICE IN ELECTROPHOTOGRAPHIC COPYING MACHINE

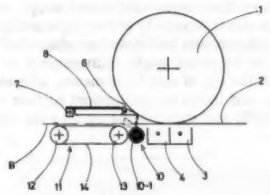
Tadaaki Kawano, Nara, and Takashi Nishida, Ibaragi, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 5, 1984, Ser. No. 596,900

Claims priority, application Japan, Apr. 18, 1983, 58-68772; Apr. 18, 1983, 58-68773

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—3 SH **4 Claims**



1. An electrophotographic copying machine inclusive of a cleaning device which cleans a copy paper separation device comprising:

a separation device comprising a claw means for separating an imaged copy paper from a photoreceptor surface;

a transport device for transferring said imaged copy paper from the surface of said photoreceptor to a subsequent station;

means for pivotably moving said claw means between a first position where said claw means is positioned close to said photoreceptor to separate said copy paper from said photoreceptor and a second position beneath a transport path for transporting said copy paper by said transport device; and

cleaning means for cleaning at least a tip of said claw means when said claw means is positioned in said second position said cleaning means being positioned juxtapositioned to said transport device beneath said transport path for said copy paper.

4,561,756

SHORT PAPER PATH COPY SHEET TRANSPORT SYSTEM

Joseph H. Lang, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 13, 1984, Ser. No. 681,355

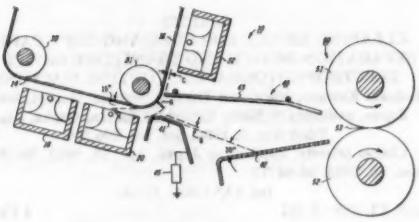
Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—3 SH **12 Claims**

1. In a copying system in which an unfused image is transferred from an initial image support surface moving at a first velocity to a copy sheet while said copy sheet is electrostatically attached to said initial image support surface and moving therewith, and in which a lead area of the transferred unfused image-bearing copy sheet is subsequently engaged by a fusing means spaced from said initial image support surface a distance less than the shortest dimension of said copy sheet and moving at a second velocity while the trail area of the same copy sheet is still moving with the initial image support surface, with the

copy sheet extending therebetween, the improvement comprising:

a baffle arrangement positioned between said initial image support surface and said fuser for allowing a concave buckle to develop in said copy sheet prior to entering a nip of said fuser means in order to compensate for the velocity mismatch between said initial image support surface and said fuser means, said baffle arrangement including a



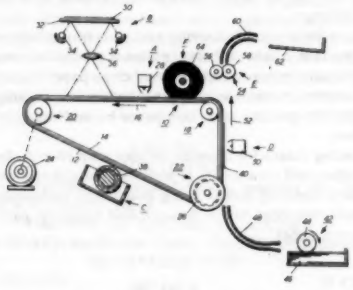
grounded passive acquisition baffle which aids in stripping said copy sheet from said initial image support surface through electrostatically attracting said copy sheet to said passive acquisition baffle, and pre-fuser baffle means positioned at an acute angle with respect to a line drawn through the nip of said fuser means, whereby copy sheets leaving said initial image support surface strike said pre-fuser baffle and then buckle up into the nip of said fuser means.

4,561,757

BELT SUPPORT APPARATUS

James A. Salomon, and Donald J. Weikel, Jr., both of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 4, 1985, Ser. No. 708,202
Int. Cl.[4] G03G *15/00*; B65G *15/60*
U.S. Cl. 355—3 BE **10 Claims**



6. An electrophotographic printing machine of the type having a photoconductive belt supported on an apparatus which moves the photoconductive belt in a pre-determined path and controls lateral movement of the photoconductive belt so that successive portions of the photoconductive belt move through processing stations disposed thereabout to form a toner powder image thereon which is transferred to a copy sheet and permanently affixed thereto, wherein the apparatus for moving the photoconductive belt and controlling lateral movement thereof includes:

at least one rotatably mounted roller;

means, interposed between said roller and the photoconductive belt, for supporting the photoconductive belt, said supporting means having a low coefficient of friction to form a low friction interface between said supporting means and said roller; and

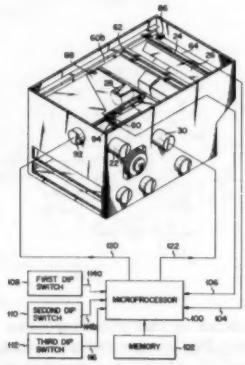
means, engaging at least one side edge of the photoconductive belt, for preventing lateral movement of the photoconductive belt with said supporting means slipping on said roller when the force applied on the side edge of the photoconductive belt is greater than the maximum frictional force between said roller and said supporting means, in the direction of lateral movement of the photoconductive belt.

4,561,758

COPYING APPARATUS WITH FOCUS-ADJUSTING MECHANISM

Yoshiaki Nawata, Yokohama, and Hideshi Oushiden, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 12, 1983, Ser. No. 560,106
Claims priority, application Japan, Dec. 13, 1982, 57-218853
Int. Cl.[4] G03G *15/04*; G03B *27/34*
U.S. Cl. 355—8 **12 Claims**



1. A copying machine comprising:

(a) a rotatable photoconductive drum having a photoconductive surface;

(b) optical means, having a plurality of optical elements, for optically scanning an original such as a paper document to form an optical image corresponding to a document image and for forming the optical image on the photoconductive surface of said photoconductive drum, said optical means comprising, as said optical elements,

lens means having an inherent focal length characteristic,

first mirror means for introducing the optical image of the paper document to said lens means, and

second mirror means for introducing the optical image from said lens means onto the photoconductive surface of said photoconductive drum, a relative positional relationship between said first and second mirror means having a variation caused by mass production even if the relative positional relationship is properly set in accordance with the inherent focal length characteristic; and

(c) focus adjusting means, including electrical devices manually operated by an operator and producing electrical digital distance data representing displacement determined by the operator, which is produced in accordance with the manual operation by the operator, for slightly moving at least one of said lens means, said first mirror means and said second mirror means in accordance with the electrical digital distance data so as to eliminate positional variations in said optical means, thereby compensating an out-of-focus state of the optical image on the photoconductive drum surface, said out-of-focus state being caused by the positional variations.

4,561,759
DEVICE FOR FILLING AND FILTERING TONER FROM STORAGE CONTAINER INTO A FEED CONTAINER FOR A PHOTOCOPIER

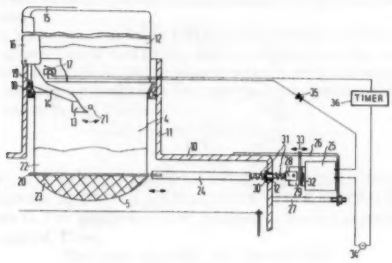
Joseph Knott, Tutzing, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 500,946, Jun. 3, 1983, abandoned. This application May 23, 1985, Ser. No. 736,989

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1982, 3224296

Int. Cl.⁴ G03G *15/06*

U.S. Cl. 355—3 DD **7 Claims**



1. In a non-mechanical printer or copier having a feed container therein and a filling opening for receiving an inverter toner storage container for emptying said toner from said storage container into said feed container, the improvement comprising:

a basket pivotally mounted in said filler opening having an upper basket housing with an outwardly slanted lip with an upper rim, said upper rim disposed for removably contacting only an edge of said storage container inverted in said filling opening at a distance below said upper rim, and having a lower basket filter connected to said upper basket housing onto which toner from said storage container is emptied;

an elastic ring seal surrounding an exterior of said upper rim and resiliently connecting said rim to said filling opening and simultaneously sealing said filling opening; and

a means for oscillating said basket about the pivotal mounting for assisting emptying of toner from said storage container and for assisting transfer of said toner through said basket filter.

4,561,760
CLEANING DEVICE FOR CLEANING COPY PAPER SEPARATION DEVICE IN ELECTROPHOTOGRAPHIC COPYING MACHINE

Tadaaki Kawano, Nara; Keizo Ito, Yamatokoriyama, and Takashi Nishida, Ibaragi, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 29, 1984, Ser. No. 645,261

Claims priority, application Japan, Sep. 6, 1983, 58-165583

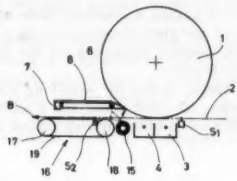
Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—3 R **5 Claims**

1. A cleaning device in an electrophotographic copying machine for cleaning a separation claw which separates a copy paper from a photoreceptor, comprising:

detection means for detecting an approach of said copy paper toward said photoreceptor and for detecting separation of said copy paper from said photoreceptor;

movement means responsive to said detection means, for pivotally moving said separation claw between a first position wherein said separation claw means becomes close to said photoreceptor to separate said copy paper from said photoreceptor, and a second position wherein said separation claw is far from said photoreceptor; and



cleaning means for cleaning at least a tip of said separation claw which is close to said copy paper while said separation claw is positioned at the second position.

4,561,761
CHARGE ERASE DEVICE FOR COPYING OR REPRODUCTION MACHINES AND PRINTERS

Wayne D. Fox, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 25, 1984, Ser. No. 624,556

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—3 R **4 Claims**

1. In an erasing device for dissipating photoreceptor charges in a xerographic type reproduction machine having a photoreceptor, an elongated light transmitting fiber opposite said photoreceptor surface at substantially right angles to the path of movement of said photoreceptor, the axial length of said fiber being at least equal to the width of said photoreceptor surface; a light source at one end of said fiber, said fiber transmitting light from said light source axially along the interior thereof toward the opposite end of said fiber; and light control means for progressively increasing the light discharge area of said fiber section in proportion to the distance along the fiber from said light source to thereby offset the loss of light intensity as said light is being transmitted through the interior of said fiber, the improvement comprising:

cover means for limiting the discharge of light from said fiber to the section of said fiber facing said photoreceptor so that light discharged from said fiber impinges on said photoreceptor surface to discharge photoreceptor surface and photoreceptor bulk charges.

4,561,762
IMAGE FORMING APPARATUS

Junji Watanabe, and Yoshiaki Nawata, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 12, 1983, Ser. No. 560,113

Claims priority, application Japan, Dec. 14, 1982, 57-218838

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—3 R **4 Claims**

1. An image forming apparatus comprising:

movable photoconductive means;

driving means comprising a stepping motor for moving the photoconductive means;

charging means for charging the photoconductive means;

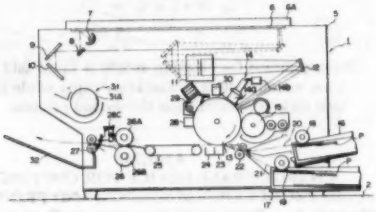
exposure means for exposing the photoconductive means to form a latent image corresponding to a document pattern on the photoconductive means;

developing means for converting the latent image on the photoconductive means into a developed image; and

transfer means for transferring the developed image to paper;

cleaning means having a cleaning blade adapted to be in contact with the photoconductive means for removing a developing medium remaining on the photoconductive means after transfer;

drive signal supply means for supplying selectively signals corresponding to a first speed and a second speed lower than the first speed to the driving means, said drive signal



supply means including output means adapted to generate drive pulses of a first pulse repetition rate in the copying mode, and to generate drive pulses of a second pulse repetition rate lower than the first pulse repetition rate in the non-copying mode thereby respectively moving the photoconductive means at the first speed in a copying mode and at the second speed for a predetermined time in a non-copying mode; and

means for separating the cleaning blade from the photoconductive means after the passage of the predetermined time.

4,561,763

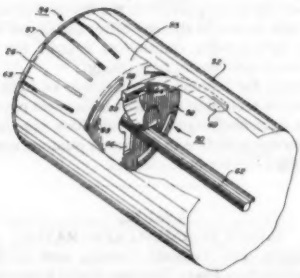
DRUM SUPPORT APPARATUS

Duane C. Basch, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 3, 1984, Ser. No. 637,654

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—3 DR **18 Claims**



1. A drum assembly comprising a cylindrical drum having a circular cross-section, a shaft positioned along the axis of said drum and a first drum supporting hub on said shaft at one end of said drum and a second drum supporting hub on said shaft at the other end of said drum, at least said first drum supporting hub having a self-centering, tapered pot-like hub configuration in which the rim of the pot-like hub comprises a plurality of circumferentially spaced resilient fingers extending at a slight incline outwardly from the axis of said pot-like hub away from the bottom of the pot-like hub, said fingers having lips at the ends of said fingers, said lips projecting away from said shaft for engagement with an end of said drum upon insertion of said pot-like hub into an end of said drum, said rim other than said lips having an outside diameter slightly larger than the inside diameter of said drum whereby said spaced fingers are compressed towards said shaft when said bottom of said pot-like hub is inserted into one end of said drum.

4,561,764

CONTROL SYSTEM FOR SCANNING ARRANGEMENT

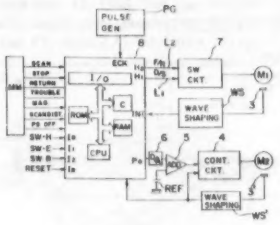
Masamichi Sugiura, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 15, 1984, Ser. No. 671,640

Claims priority, application Japan, Nov. 16, 1983, 58-216699

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—8 **6 Claims**



1. A control system for a scanning arrangement adapted to be driven for reciprocating movements by a motor, which comprises a power source circuit, means for outputting a signal upon turning off of the power source, provided in said power source circuit, a capacitor means connected in parallel with said motor, provided at a stage subsequent to said power source off signal output means in said power source circuit, and a control means for driving the motor, arranged to control in such a manner as to brake said motor upon output of the power source off signal from said power source off signal output means during energization of the motor, whereby said scanning arrangement is successfully reduced in speed so as to be stopped, even when the power source is turned off during movement thereof.

4,561,765

IMAGE FORMING APPARATUS

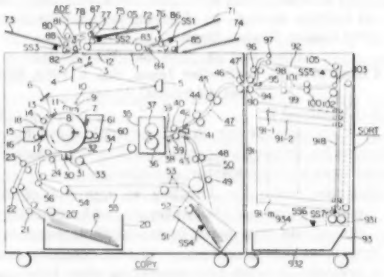
Shunichi Masuda, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 26, 1983, Ser. No. 461,010

Claims priority, application Japan, Feb. 1, 1982, 57-13283; Feb. 1, 1982, 57-13284; Mar. 24, 1982, 57-45649; Mar. 24, 1982, 57-45650; Mar. 24, 1982, 57-45651; Mar. 24, 1982, 57-45652; Mar. 24, 1982, 57-45653

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—14 SH **11 Claims**



1. An image forming apparatus comprising:

an original feeding device adapted for feeding originals to a determined position wherein said original feeding means includes first and second original stacking means on which originals are selectively placed for being withdrawn and fed to said determined position by said feeding device;

image forming means adapted for forming images of said originals on recording sheets, and being capable of said image formation in first and second image forming modes, wherein said originals are placed on said first original stacking means for image formation in said first mode, and on said second original stacking means for image formation in said second mode;

selecting means for selecting either said first or said second image forming mode, whrein said selecting means provides an output signal corresponding to the selected mode; and

display means coupled to said selecting means for indicating upon which of said first or second original stacking means said originals should be placed, wherein said indication by said display means is in response to the output signal from said selecting means.

4,561,766

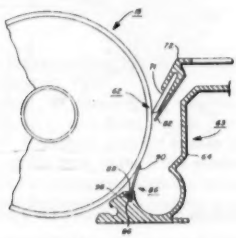
BLADE CLEANER APPARATUS FOR REMOVING TONER FROM A CHARGE-RETENTIVE SURFACE

Wayne D. Fox, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 22, 1984, Ser. No. 623,592

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—15 **12 Claims**



1. Cleaner apparatus for removing residual toner from a charge-retentive surface, said apparatus comprising:

a housing;

a blade holder in said housing;

a blade member supported within said housing by said blade holder; and

means supported within said housing adjacent said blade but not contacting it for causing said toner to fall in a generally downward direction toward the bottom of said housing.

4,561,767

BOTH-SIDE RECORDING APPARATUS

Tomohiro Aoki, Yokohama, and Hidetoshi Tanaka, Musashino, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 611,430, May 17, 1984, abandoned, which is a continuation of Ser. No. 371,018, Apr. 22, 1982, abandoned.

This application Feb. 20, 1985, Ser. No. 703,497

Claims priority, application Japan, Apr. 28, 1981, 56-64502

Int. Cl.⁴ G03B *27/32, 27/52*

U.S. Cl. 355—26 **2 Claims**

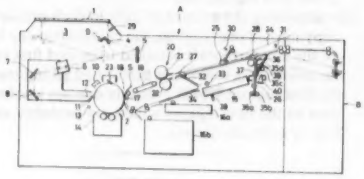
1. A recording apparatus for recording images on both sides of a sheet, comprising:

sheet feeding means for feeding copy sheets to a recording portion of said apparatus;

first feeding means for receiving a predetermined number of the sheets in a relay tray after they are fed by said sheet feeding means and after first images are recorded by said recording portion on first sides of said sheets, and for then feeding the sheets from the relay tray to said recording portion for recording second images on second sides of said sheets;

first discharge means for discharging the sheets which are image-recorded on both sides thereof in a reversing mode where the sheets are reversed or in a non-reversing mode where the sheets are not reversed;

second feeding means for detecting a lacking number of both-side recorded sheets, as compared to the predetermined number, during recording of the second images on the second sides of the sheets, whereas said second feeding means, after the sheets in the relay tray are fed for recording second images reserves the lacking number of sheets in the relay tray and then feeds the reserved sheets from the relay tray to the recording portion for recording first images on the second sides of the sheets; and



second discharge means for discharging the sheets image-recorded on both sides thereof at the recording portion by said second feeding means in the opposite mode to the mode effected by the first discharge means.

4,561,768

COLOR COPYING METHOD

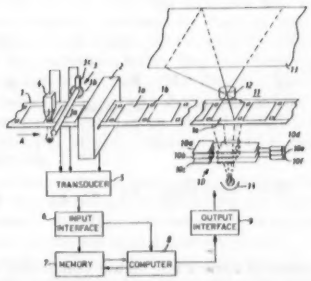
Manfred Fürsich, Taufkirchen, and Helmut Treiber, Munich, both of Fed. Rep. of Germany, assignors to Agfa Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 15, 1984, Ser. No. 610,399

Claims priority, application Fed. Rep. of Germany, May 17, 1983, 3317818

Int. Cl.⁴ G03B *27/78*

U.S. Cl. 355—38 **31 Claims**



1. A method of determining the amount of light in each primary color for copying a colored original, said method comprising the steps of:

(a) measuring the transparency in each primary color of a photosensitive article containing at least one colored original, the measuring step being performed at a plurality of first regions located in said one original, and a plurality of second regions located in a border of said one original;

(b) analyzing the measurements obtained during the measuring step to identify at least one region having a transpar-

ency which equals or exceeds the transparencies of the remaining regions;

(c) evaluating said first regions to detect color dominants, the evaluating step for each first region including processing the respective measurements to derive a characteristic value representing at least one color characteristic of the first region relative to the corresponding color characteristic of said one region, and the evaluating step for each first region further including comparing the respective characteristic value with a reference value which is a function of the density of said one region to thereby establish the probable presence or absence of a color dominant in the first region; and

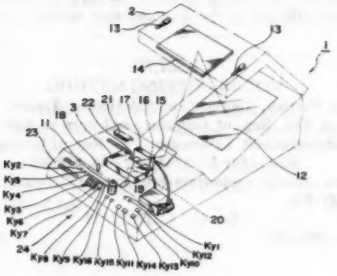
(d) calculating the amount of light in each primary color for copying said one original, the calculating step being based on the measurements obtained from said first regions, and the calculating step being performed giving less weight to the first regions which probably contain a color dominant than to the first regions which are probably substantially free of color dominants.

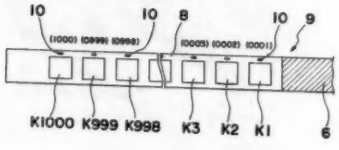
4,561,769

COMBINED CAMERA AND VIEWER

Takeshi Okano, Nishinomiya, and Shuichi Ohtsuka, Kanagawa, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 19, 1984, Ser. No. 652,030
Claims priority, application Japan, Sep. 19, 1983, 58-173870
Int. Cl.⁴ G03B *13/28*
U.S. Cl. 355—45 **11 Claims**





1. A combined camera and viewer comprising a self-contained apparatus capable of operating selectively under camera and projector modes, one mode at a time, said apparatus, when under the camera mode, being operable to expose image information on a photosensitive film having a plurality of frames, and said apparatus, when under the projector mode, being operabe to project onto a screen an image recorded on the photosensitive film, said apparatus comprising:

a film transporting means for transporting the film to bring any one of the frames selectively to one of frame exposing and frame projecting positions;

means for detecting whether or not any one of the frames has been brought to one of said exposing and projecting positions; and

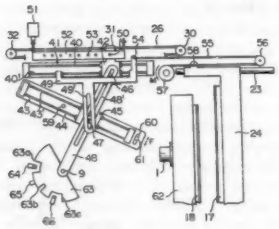
means for discriminating whether or not an image has been recorded on said any one of the frames, means, when the apparatus is set to operate under the camera mode, responsive to said discriminating means determining whether or not the image information has been recorded on such one of the frames, for inhibiting such one of the frames, if having the image information recorded thereon, from being brought to the exposing position, and means, when the apparatus is set to operate under the projector mode, responsive to said discriminating means determining whether or not the image information has been recorded on such one of the frames for inhibiting said one frame if the image information has not yet been recorded thereon, from being brought to the projecting position.

4,561,770

MAGNIFICATION CHANGING DEVICE FOR COPYING MACHINE

Isao Yamaguchi, Yokohama; Yusuke Sasamori, Atsugi, and Hideo Takaoka, Tokyo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 21, 1984, Ser. No. 624,781
Claims priority, application Japan, Jun. 30, 1983, 58-119715
Int. Cl.⁴ G03B *27/34, 27/40*
U.S. Cl. 355—57 **7 Claims**



1. A magnification changing device for a copying machine comprising:

a first reflecting mirror system adapted to be moved at a constant speed and arranged to receive the optical image from an object, said first reflecting mirror system being constituted by a first mirror reclined at an angle of 45° to the plane of said object;

a second reflecting mirror system adapted to receive the light reflected by said first reflecting mirror system and to move in the same direction as said first reflecting mirror system at a speed which is a half that of the movement of said first reflecting mirror system, said second reflecting mirror system being constituted by a second mirror having a reflecting surface parallel to the reflecting surface of said first mirror, and a third mirror having a reflecting surface orthogonally opposing the reflecting surface of said second mirror;

a fixed lens upon which the light reflected by said second reflecting mirror system impinges;

a movable third reflecting mirror system adapted to receive the light coming through said lens, said third reflecting mirror system being constituted by a fourth mirror having a reflecting surface orthogonally opposing the reflecting surface of said third mirror across said lens, and a fifth mirror having a reflecting surface orthogonally opposing the reflecting surface of said four mirror; and

a magnification changing mechanism for moving said reflecting mirror systems in synchronism with each other such that a relationship corresponding to a varying magnification degree is maintained between the distance between said first and second reflecting mirror systems and

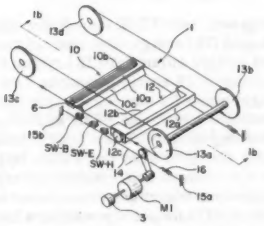
the distance between said lens and said third reflecting mirror system, whereby any desired magnifcation degree may be effected by said magnification changing mechanism while focussing the light from said third reflecting mirror system on a photosensitive material.

4,561,771

SYSTEM FOR CONTROLLING THE RECIPROCATION OF A SCANNING APPARATUS

Masamichi Sugiura, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 9, 1983, Ser. No. 521,624
Claims priority, application Japan, Aug. 10, 1982, 57-139323
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—14 R **18 Claims**



1. A system for controlling the reciprocation of a scanning apparatus comprising:

scanning means for scanning an original, said scanning means adapted to scan from a home position across said original to a scanned position and to return from the scanned position back to the home position;

a D.C. motor for diving said scanning means;

braking means for providing a braking action to said D.C. motor;

a switching circuit for providing electric power to said D.C. motor;

home position detecting means for detecting when said scanning means is in said home position;

measure means for measuring a distance of movement of said scanning means;

speed detecting means for detecting the speed of said scanning means;

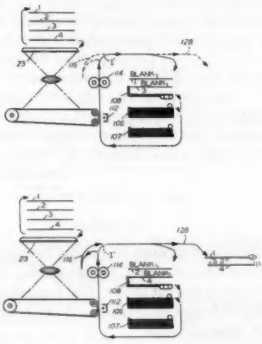
control means coupled to said switching circuit for controlling the movement of the scanning means such that: said scanning means scans across said original at a predetermined constant speed; when said scanning means reaches said scanned position, it starts to return back toward said home position by application of a constant supply of power having a predetermined level; when said scanning means is returned to a preselected position, said braking means provide a braking action which lasts until the returning speed is reduced to a predetermined low speed as detected by said speed detecting means; said scanning means is returned at said low constant speed until said home position detecting means detects that said scanning means is in said home position; said measure means measures the distance of movement of said scanning means at said low constant speed; said scanning means is stopped at said home position; and said distance is used for calculating a preselected position for the next cycle of scan so that said distance in the next cycle of scan is controlled to be substantially equal to a predetermined distance.

4,561,772

RECIRCULATIVE DOCUMENT DUPLEX COPYING

Charles E. Smith, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 25, 1983, Ser. No. 497,944
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—14 SH **5 Claims**



1. In the method of copying a set of simplex document sheets, by their plural recirculation in reverse serial order on a copier, with selection of duplex copying for providing precollated sets of duplex (two-sided) copy sheets from said simplex document sheets, and with counting of the number of said simplex document sheets in said document set in the first circulation thereof for determining if there is an odd or even said number of said simplex document sheets, to control said duplex copying in response to said selection of duplex copying, the improvement comprising the steps of:

presetting said copier to initially operate as if it were predetermined whether there were an odd or even number of simplex document sheets in the set of document sheets before said counting and before said determining if said number is actually odd or even,

in response to said presetting step, and said selection of duplex copying, automatically copying only alternate document sheets of said set of simplex document sheets in their first circulation before they have been counted and irrespective of whether or not the copy sheets are non-orientation sensitive copy sheets such as plain paper, or orientation-restricted copy sheets requiring consistent inversion for properly oriented output or binding edge orientation,

counting the number of document sheets in said set thereof while they are being so copied during said first circulation to actually determine whether there are an odd or even number by the end of said first circulation,

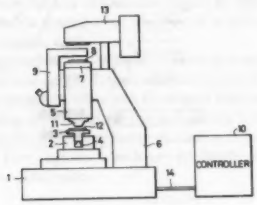
then automatically, in the second circulation of said set of document sheets, in response to said actual determination in said counting step of whether there are an odd or even number of document sheets in the document set, copying only the other alternate document sheets twice (onto two copy sheets) to correct said duplex copying for said orientation-restricted copy sheets if said presetting step does not correspond to said actual determination, or copying all of said document sheets once if said presetting step does correspond to said actual determination,

then copying all of the document sheets in subsequent copying circulations thereof.

4,561,773
PROJECTION EXPOSURE APPARATUS

Hiroshi Sato, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 550,633, Nov. 10, 1983, abandoned. This application Mar. 13, 1985, Ser. No. 710,936
Claims priority, application Japan, Nov. 17, 1982, 57-202477
Int. Cl.[4] G03B *27/52, 27/70*
U.S. Cl. 355—43 9 Claims

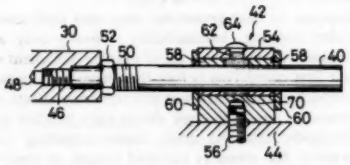


1. A projection exposure apparatus having:
a projection optical system for projecting an image of a first object onto a second object, said projection optical system forming different imaging positions by an alignment light and an exposure light;
a laser light source emitting the alignment light;
a light source for exposure emitting the exposure light different in wavelength from the alignment light; and
means for changing the relative positional relation among said first object, said second object and said projection optical system when light is changed from the alignment light to the exposure light.

4,561,774
ORIGINAL PLATE SCANNING DEVICE

Toshikatsu Takahashi, and Nobuo Murata, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 459,075, Jan. 19, 1983, abandoned. This application May 20, 1985, Ser. No. 736,398
Claims priority, application Japan, Jan. 22, 1982, 57-8543
Int. Cl.[4] G03B *27/62*
U.S. Cl. 355—75 10 Claims

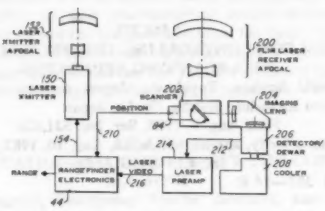


1. An original plate scanning device for a microfilm copying machine, comprising:
a guide stand;
a straight shaft member which extends parallel with said guide stand;
a bearing for supporting said shaft member, said shaft member being movable linearly relative to said bearing; and
a semi-solid state lubricant sealed around said shaft member and having an unworked penetration between 200 and 230, one of said shaft member or said bearing being secured to an original plate, with the other being secured to a microfilm copying machine body, said lubricant functioning as a brake and damping mechanism on the shaft for maintaining constant the speed of the linear movement of said shaft member and for absorbing vibrations from said copying machine body.

4,561,775
THERMALLY INTEGRATED LASER/FLIR RANGEFINDER

Thomas R. Patrick, Richardson; Richard Powell, and Barry N. Berdanier, both of Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 7, 1983, Ser. No. 472,536
Int. Cl.[4] G01C *3/08;* G02B *26/10*
U.S. Cl. 356—5 2 Claims



1. An integrated laser/FLIR rangefinder comprising:
(a) an infrared (IR) energy optic channel means including a forward looking infrared (FLIR) system for producing a visible image of IR energy emanating from a scene and an optic sight means for viewing the visible image and sighting a selected target, said FLIR including a plurality of light emitting diodes (LED's) and a scanner means for reflecting the light from the LED's responsive to the scanner's movement and wherein said signal means for initiating a laser trigger generating means includes at least one of the LED's for use in producing a laser trigger pulse in response to a preselected position of the scanner and a laser return detecting means for producing a signal indicative thereof;
(b) a visible light energy optical channel means in juxtaposition to the IR energy optic channel including a telescope sight for sighting a visible target;
(c) a laser transmitter means including a laser operatively connected to the visible light energy optical channel for injecting a laser beam therein for transmission to a target; and
(d) a laser rangefinder electronic means including a counting means operatively connected to the laser transmitter means and laser return detecting means for counting the time between the firing of the laser and detection of the laser return for rangefinding.

4,561,776
ELECTRO-OPTICAL SENSORS FOR TOOL AND ROBOTIC INSPECTION

Timothy R. Pryor, Tecumseh, Canada, assignor to Diffracto Ltd., Ontario, Canada

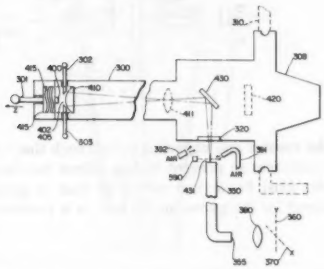
Filed Mar. 25, 1981, Ser. No. 247,399
Int. Cl.[4] G01N *21/47;* G01B *11/24, 11/30*
U.S. Cl. 356—72 30 Claims

1. A method of determining a dimension and a surface characteristic of an object comprising:
providing a machine comprising means for interchangeably positioning sensor members in an operative position on said machine;
providing a plurality of different sensor members, each sensor member being positionable in said operative position and comprising optical means mounted therein for receiving light from an object or from a contact member in contact with said object and for conveying said light out of said sensor member, said optical means of a first sensor member being constructed and arranged for determining a dimension of an object and said optical means of a second sensor member being constructed and arranged for determining a surface characteristic of an object;

providing an image scanning light detector remote from said sensor for detecting said light conveyed out of said sensor member;

positioning said first sensor member in said operative position on said machine;

directing light onto an object or onto a contact member in contact with an object whereby light from said object or contact member is received by said optical means of said first sensor member and is directed out of said first sensor member and to said remote image scanning light detector;



determining, from light detected by said remote image scanning light detector, a dimension of said object;

positioning said second sensor member in said operative position on said machine;

directing light onto an object or onto a contact member in contact with an object whereby light from said object or contact member is received by said optical means of said second sensor member and is conveyed out of said sensor member and to said image scanning light detector; and

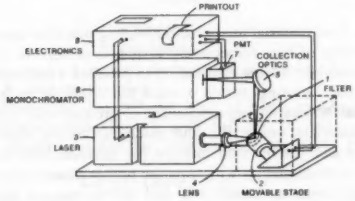
determining, from light detected by said image scanning light detector, a surface characteristic of said object.

4,561,777

APPARATUS AND METHOD FOR QUANTITATIVE DETERMINATION OF MATERIALS CONTAINED IN FLUIDS

Leon J. Radziemski, and David A. Cremers, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 7, 1982, Ser. No. 415,515
Int. Cl.[4] G01N *21/63*
U.S. Cl. 356—318 **17 Claims**



11. An apparatus for investigating fluid samples having at least one material carried by particulates suspended therein the concentration of which is to be monitored, said apparatus comprising in combination:

a. a filter of known collection efficiency through which as been passed a known volume of a fluid sample and upon which a quantity of the material to be monitored has been collected;

b. means for generating repetitively pulsed, high intensity laser radiation;

c. cylindrical lens means for receiving the repetitively pulsed, high intensity laser radiation generated by said laser radiation generating means, and for focusing the laser radiation into an elongated shape having significant area on the surface of the filter material, thereby inducing dielectric breakdown to occur over a significant portion of substantially the surface of the filter material from which there is emitted electromagnetic radiation which includes ionic and neutral atomic spectral features characteristic of the elemental species present on the filter material surface portion, molecular emissions, and spectrally broad background emissions;

d. means for quantitatively detecting and recording the emitted characteristic spectral features; and

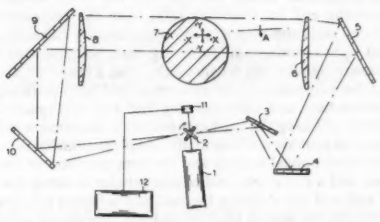
e. means for calibrating the magnitude of the quantitatively detected, emitted characteristic spectral features in order to relate the magnitude thereof to the material concentration to be monitored.

4,561,778

APPARATUS FOR MEASURING THE DIMENSIONS OF CYLINDRICAL OBJECTS BY MEANS OF A SCANNING LASER BEAM

Harald Kleinhuber, P.O. Box 157, S-152 00 Strangnas, Sweden

PCT No. PCT/SE83/00209, § 371 Date Jan. 3, 1984, § 102(e) Date Jan. 3, 1984, PCT Pub. No. WO83/04303, PCT Pub. Date Dec. 8, 1983
PCT Filed May 26, 1983, Ser. No. 584,950
Claims priority, application Sweden, May 28, 1982, 8203310
Int. Cl.[4] G01B *11/08*
U.S. Cl. 356—387 **1 Claim**



1. An apparatus for measuring the dimensions of cylindrical objects with the aid of a scanning laser beam, which is directed from a source (**1**) of laser light onto a rotating mirror (**2**) and through a first lens (**6**) located a focal-length distance from the centre of rotation of the mirror, the beam being arranged to sweep over one side of the object (**7**) and the laser light which passes the sides of said object is reflected onto the rotating mirror and to a light detector (**11**) arranged to control a data processor (**12**) which determines and indicates the sensed dimension, the apparatus being mainly characterized by means (**2,10,9,8**) arranged to cause the beam to be directed towards and to sweep over the other, opposite side of said object (**7**) alternating with the sweep over said first side of said object, the data processor being arranged to formulate the mean value of the measuring values sensed on said first and said second side of the object; in that the mirror (**2**) is reflective on both sides thereof and the laser beam, during one half of a revolution of said mirror is arranged to be directed by said mirror through a first system of fixed mirrors (**3, 4,5**) onto said first lens (**6**) so as to sweep across one side of the object (**7**); in that the beam is arranged to be directed towards the detector via a second lens (**8**) which is located on the opposite side of the object (**7**) to be measured and a second system of fixed mirrors (**9, 10**) via the rotating mirror (**2**); and in that the beam during the subsequent half revolution of the rotating mirror (**2**) is directed onto the other side of the object (**7**) via said second

system of fixed mirrors (10,9) and said second lens (8). the beam being directed onto the detector (11) via the first lens (6) and said first system (5,6,4) via the rotating mirror (2).

4,561,779

INSTRUMENT FOR MEASURING CONCENTRATION OF SUBSTANCE IN SUSPENSION

Teruyuki Nagamune, Wako; Ichiro Inoue, Tokyo, and Noburu Takematsu, Kawagoe, all of Japan, assignors to Rikagaku Kenkyusho, Wako, Japan

Filed Jan. 7, 1983, Ser. No. 456,414
Int. Cl.⁴ G01N *21/01*
U.S. Cl. 356—442 **5 Claims**

1. An instrument for measuring the concentration of a suspension within a cell in terms of its optical density comprising a tubular housing accommodating a pair of light conducting means, one having a light emitting end for supplying light to the suspension within the cell and the other having a light receiving end for receiving light from the suspension within the cell and supplying it to an optical density measuring means, said light emitting and receiving ends being spaced apart to transmit light to and receive light from a space within the cell for the suspension to be measured, and light diffusing means intermediate said light emitting end and said space for sufficiently diffusing the light emitted to the suspension within said space to provide a substantially linear relationship between the measured optical density and the concentration of the suspension, and a cap at one end of said tubular housing, the interior of said end cap defining the cell, and wherein inlet and outlet apertures are spaced apart in said cap, one closer to the end of the cap and the other more remote from the end, and wherein said inlet aperture is provided with a mesh to prevent bubbles from entering the space within the cell.

4,561,780

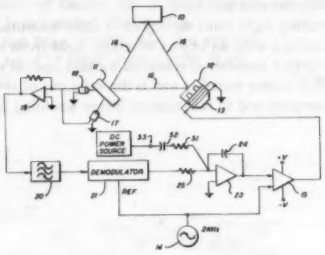
PATHLENGTH CONTROLLER FOR RING LASER GYROSCOPE

Bo H. G. Ljung, Wayne, and Hyman Cohen, Fairlawn, both of N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Apr. 28, 1980, Ser. No. 144,701
Int. Cl.⁴ G01C *19/64*
U.S. Cl. 356—350 **1 Claim**

1. In a ring laser gyroscope path loop servo control system in which an oscillation of the laser beam is brought about by vibrating a flexible mirror and the amplitude modulation resulting therefrom detected and demodulated and used to control an integrator which in turn provides a control signal which controls the position of the flexible mirror to maintain the proper pathlength, a method of avoiding starting the ring laser gyroscope at a point where it operates with two equal longitudinal modes comprising, automatically applying to the integrator a bias voltage only during start-up which biases the integrator to a voltage at which lock-in to the point where two equal longitudinal modes exist is not possible,

wherein said step of applying a bias comprises applying a voltage, at start-up, through a capacitor and resistor in series to the input of the said integrator, whereby said bias will exist only during start-up and further including the step of selecting the voltage applied and the time constant



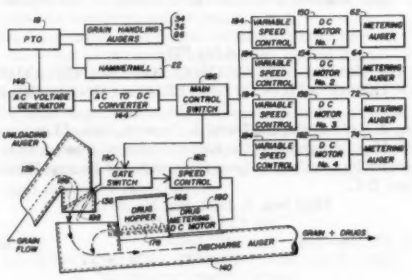
of the resistor and capacitor circuit such that a bias voltage sufficient to prevent lock-in where two longitudinal modes exist for a time period at least as great as that required for the gyroscope to lock-in is provided.

4,561,781

AGRICULTURAL FEED BLENDING APPARATUS

Shaun A. Seymour, New Holland, Pa., assignor to Sperry Corporation, New Holland, Pa.

Filed May 31, 1984, Ser. No. 615,617
Int. Cl.⁴ B01F *15/02*
U.S. Cl. 366—132 **12 Claims**



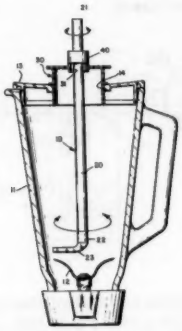
1. A feed material mixing and blending machine comprising a plurality of bins respectively arranged to receive different feed materials, mixing mechanism to produce a mixture of said materials, metering means in each bin operable to feed said materials to said mixing mechanism to produce said mixture of said materials, conveying and discharge means operable to receive and convey said mixture for removal from said machine, in combination with separate power means respectively for said metering means and said conveying and discharge means, a container supported in said machine in communication with said discharge means and adapted to contain an additive material, additional metering means in said container operable to feed a controlled amount of said additive material to said discharge means and powered by the power means for said metering means for said bins, and control means for said power means respectively operable to stop at least the metering means for said additive material when feeding of the additive material is to stop.

4,561,782

TAMPING AND STIRRING ROD FOR USE WITH A FOOD AND BEVERAGE BLENDER

Douglas C. Jacobsen, and Dennis D. Jacobsen, both of 320 Kristmont, Lodi, Calif. 95240

Filed Sep. 7, 1984, Ser. No. 648,871
Int. Cl.[4] B01F *15/00*
U.S. Cl. 366—349 **1 Claim**



1. For use with a receptacle of a food and beverage blender including a plurality of rotating blades disposed inside the receptacle having an open top and a top cover, which is formed out of a flexible material with a hole in its center, a tamping and stirring rod for urging either foodstuff or ice cubes into the receptacle, said tamping and stirring rod comprising:

a. an elongated, substantially cylindrical member which has a distal end and a proximal end and which is formed out of a flexible material with said elongated, substantially cylindrical member being an integral member with a foot at its said distal end;

b. a plastic cap which is snugly inserted into the top cover and which has a bore which has a diameter which is slightly larger than the diameter of said elongated, substantially cylindrical member and which is concentric to the hole in the top cover and through which said elongated, substantially cyclindrical member is slidably inserted; and

c. a collar which has an outer diameter which is larger than the diameter of said bore in said plastic cap and which is snugly, but slidably, coupled to said elongated, substantially cylindrical member at its said proximal end that so that said elongated, substantially cylindrical member can not pass completely through said bore in said plastic cap and contact any of the rotating blades and yet it still can contact the sidewalls of the receptacle.

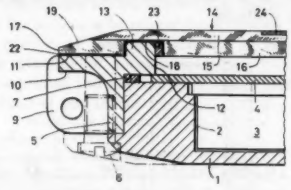
4,561,783

WATCHCASE

Marc Lederrey, Le Landeron, Switzerland, assignor to Montes Rado S.A., Biel, Switzerland

Continuation of Ser. No. 267,692, May 27, 1981, abandoned. This application Mar. 27, 1985, Ser. No. 717,464
Claims priority, application Switzerland, May 31, 1980, 4228/80
Int. Cl.[4] G04B *37/00*
U.S. Cl. 368—309 **12 Claims**

1. A watchcase comprising a metallic section, a caseband and a glass face, the metallic section having first and second sides and including means for accommodation of a watch movement and a watch dial, the watch dial being located on the first side of the metallic section, the caseband having a central opening therethrough for accommodation of the metallic section, the caseband surrounding a periphery of the metallic section and having top and bottom sides, the glass face extending over the whole face of the first side of said metallic section and the top surface of the caseband, the glass face extending to at least an outermost edge of the caseband and being removably secured to the top side of the caseband, said glass face comprising an external plate of transparent material



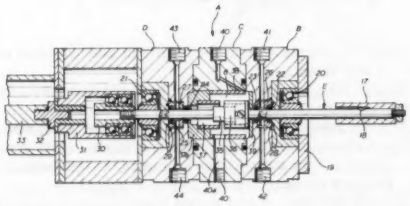
and, permanently fixed thereto, a bezel-like fitting forming an opaque frame around said external plate so as to constitute the sole opaque watchcase part being visible around the watch dial.

4,561,784

DEVICE AND METHOD FOR FRICTIONALLY TESTING MATERIALS FOR IGNITABILITY

Frank J. Benz; Randall C. Shaw, and David S. Dixon, all of Las Cruces, N. Mex., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 17, 1984, Ser. No. 571,616
Int. Cl.[4] G01N *25/00*
U.S. Cl. 374—8 **11 Claims**



1. A test device for evaluating ignitability of materials under simulated operating conditions in stressed, oxidizer environments comprising a body having a sealable test chamber, a rotationally and axially powered shaft extending axially through said chamber and with seals and bearings in said body on opposite sides of said chamber, means for securing a test sample to said shaft in said chamber for rotation with said shaft, a stationary wear surface of a sample secured to at least a portion of a wall in said chamber, powered means to shift the test sample on said shaft into frictional contact with said surface, means to supply oxidizer to said chamber, means to sense and record friction-powered temperature and ignition of test sample.

4,561,785

MODIFIED THROTTLING CALORIMETER

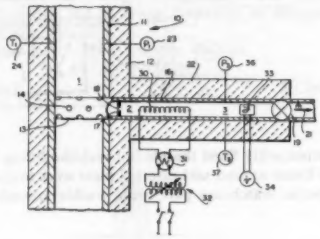
Stephen L. Long, Houston, and Yin L. Cheung, Sugarland, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed May 18, 1984, Ser. No. 611,657
Int. Cl.[4] G01K *17/12*
U.S. Cl. 374—42 **7 Claims**

1. Apparatus for obtaining a measure of the quality of saturated steam which occupies a vessel, said steam having liquid and vapor components, comprising

(1) means for drawing from said vessel at a constant mass flow rate through a throttling orifice a flowing sample of said steam,

(2) means for adding heat to said flowing throttled sample of steam at a rate sufficient to gasify completely said flowing throttled sample of steam,
(3) means for measuring the net rate at which heat is added to said flowing throttled sample of steam,
(4) means for measuring said mass flow rate of said flowing sample of steam,



(5) means for measuring one of the temperature and the pressure of said saturated steam in said vessel,
(6) means for measuring the temperature of said heated flowing throttled sample of steam, and
(7) means for measuring the pressure of said heated flowing throttled sample of steam, such that a measure of the quality of said saturated steam in said vessel can be obtained by the equation

$$X_1 = \frac{1}{h_{fg1}}\left(h_3 - h_{f1} - \frac{(\dot{Q}_{in})_2 - (\dot{Q}_{out})_2}{\dot{m}}\right)$$

where X_1 is a measure of the quality of said saturated steam in said vessel,
$(\dot{Q}_{in})_2 - (\dot{Q}_{out})_2$ is the net rate of heat addition measured by the means of step (3),
m is the mass flow rate measured by the means of step (4),
h_{fg1} is the enthalpy of vaporization of steam in said vessel as obtained from steam tables for one of the temperature and pressure measured by the means of step (5),
h_3 is the enthalpy of said heated flowing sample of steam as obtained from steam tables for the temperature measured by the means of step (6) and the pressure measured by the means of step (7),
and h_{f1} is the enthalpy of the liquid phase of steam in said vessel as obtained from steam tables for one of the temperature and pressure measured by the means of step (5).

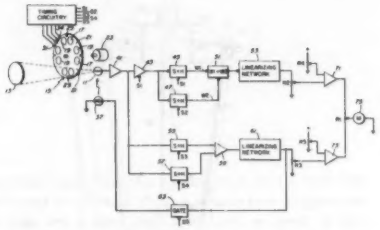
4,561,786

TEMPERATURE MEASURING APPARATUS

Alan S. Anderson, Littleton, Mass., assignor to Williamson Corporation, Concord, Mass.

Filed Mar. 15, 1984, Ser. No. 589,745
Int. Cl.[4] G01J *5/30*
U.S. Cl. 374—129 **3 Claims**

1. Temperature measuring apparatus for measuring the temperature of a target comprising:
a detector for radiant energy;
optical means for directing radiant energy from the target onto said detector;
means located between the target and said detector for alternately interposing first and second wavelength filters into the optical path of the directed energy during respective first and second time intervals thereby to generate, from said detector, respective first and second detector signals during said first and second time intervals;
source means timed in synchronism with said filter interposing means for selectively providing a controllable level of energy incident on said detector thereby to generate, from said detector, a third detector signal during a third time interval; which is between said first and second time intervals;
dividing circuit means for generating a first intermediate signal which is a function of the ratio of the first and second detector signals;
circuit means for generating a control signal which is a function of the difference between said first and third signals and for energizing said source means as a function of said control signal;



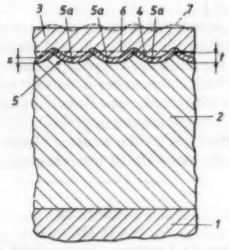
means for providing a second intermediate signal which is a function of said control signal; and
means for combining said first and second intermediate signals in selectable proportion thereby to generate a temperature signal which represents the temperature of the target relatively independent of target surface characteristics.

4,561,787

COMPOSITE SLIDING SURFACE BEARING

Otto Ehrentraut, Gmunden, and Ulf G. Ederer, Laakirchen, both of Austria, assignors to Miba Gleitlager Aktiengesellschaft, Laakirchen, Austria

Filed Feb. 15, 1985, Ser. No. 702,362
Claims priority, application Austria, Feb. 27, 1984, 628/84
Int. Cl.[4] F16C *33/12*
U.S. Cl. 384—295 **2 Claims**



1. In a composite sliding surface bearing comprising
a backing shell having an inside surface,
a bearing metal layer provided on the inside surface of said backing shell and having an inside surface,
an interlayer provided on the inside surface of said bearing metal layer and having an inside surface, and
a sliding surface layer provided on the inside surface of said interlayer,
the improvement residing in that
said inside surface of said bearing metal layer is profiled in a depth which amounts to at least 5 micrometers and exceeds 1.5 times the thickness of said interlayer and
said interlayer has a substantially constant thickness and conforms to the profiled inside surface of said bearing metal layer.

4,561,788
CLUTCH RELEASE BEARING DEVICE

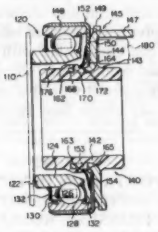
Kenji Tanaka, Fujisawa, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 27, 1984, Ser. No. 686,724

Claims priority, application Japan, Oct. 4, 1984, 59-149593[U]

Int. Cl.⁴ F16C *27/06*; F16D *23/14*

U.S. Cl. 384—513 **2 Claims**



1. A clutch release bearing device including a clutch release bearing, bearing retaining means movable along a fixed guide for guiding said clutch release bearing by a clutch operating fork member and retaining said clutch release bearing for self-aligning movement, and a biasing member interposed between said clutch release bearing and said bearing retaining means to urge said clutch release bearing toward said bearing retaining means, characterized in that said bearing retaining means comprises synthetic resin cylindrical portion made of synthetic resin fitted to said fixed guide, and a metal radially extending portion made of a metal extending radially outwardly from said cylindrical portion and retaining said clutch release bearing for self-aligning movement and engageable with said clutch operating fork member, said metal radially extending portion having an inner end portion, said metal inner end portion being embedded in said synthetic resin cylindrical portion, a metal cylindrical portion being formed on the inner end portion of said radially extending portion and a plurality of apertures being formed in said metal cylindrical portion circumferentially thereof, said apertures being filled with synthetic resin, the positions of said apertures being at positions which can be reached by the action of said biasing member.

4,561,789
THERMAL INK TRANSFER PRINTING SYSTEM

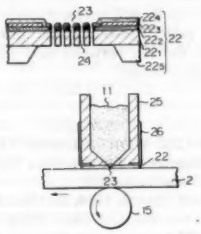
Takashi Saito, Yokosuka, Japan, assignor to Nippon Telegraph & Telephone Public Corp., Tokyo, Japan

Filed Jun. 22, 1984, Ser. No. 623,292

Claims priority, application Japan, Jun. 23, 1983, 58-111800; Jul. 16, 1983, 58-128753; Aug. 25, 1983, 58-154147; Dec. 23, 1983, 58-242073; Jan. 7, 1984, 59-526

Int. Cl.⁴ B41J *3/12, 3/20, 27/20*

U.S. Cl. 400—120 **18 Claims**



1. A thermal ink transfer printing system comprising an ink material selected from the group consisting of thermal meltable inks and thermal sublimatable inks in which said ink material at ambient temperature is non-liquid and contains solid ink particles, a container for said ink material, at least a part of one wall of said container being a porous filter material, means for selectively heating said ink material in said container adjacent said filter in the pattern to be printed for activating said ink and causing a portion of said activated ink to be transferred through the plurality of pores in said filter in the selected pattern to be printed and to print the image of said pattern on a paper in front of said filter.

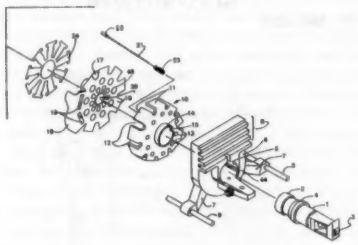
4,561,790
WIRE MATRIX PRINT HEAD APPARATUS

Vaughn R. Evans, West Lebanon, N.H.; Richard H. Harris; Allan C. Thorpe, both of Raleigh, N.C., and John E. Watts, Cary, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 28, 1985, Ser. No. 695,339

Int. Cl.⁴ B41J *3/12*

U.S. Cl. 400—124 **4 Claims**



1. An improved wire matrix print head, comprising:

a molded unitary wire guide having a plurality of straight channels for guiding print wires, said channels forming a circular array at one end of said guide and emerging as at least one straight line array at the other end of said guide;

a unitary magnetic flux return member formed as a castellated cup having an approximately circular castellated wall and a circular planar bottom surface with a central circular aperture therein;

a circular sleeve tube inserted in said circular aperture and extending axially therethrough towards the top of said flux return member and projecting axially outward from the bottom thereof, said wire guide being inserted into said sleeve tube and having an abutment molded thereon to limit the total depths of insertion therein;

a plurality of electromagnets comprising individual magnetic cores with windings thereon, said electromagnets being affixed to said flux return member with said cores forming a circular array concentric with said wall of said flux return member;

a plurality of magnetic armatures, each of said armatures being pivotally supported on the top of a section of the wall of said flux return member on a said castellated segment thereof and extending radially inward therefrom across a said core towards the center of said sleeve tube;

a plurality of print wires contained in said straight channels in said wire guide, said wires each having an enlarged head end means attached thereto at said end of said wire guide having said circular array, each said armature abutting an individual one of said head end means on a said wire; and

a molded unitary backstop means overlying said armatures to absorb rebound energy therefrom; and

a molded unitary armature retainer cage means for maintain-

ing said backstop and said armatures in alignment with said head end means of said wires; and

a back cover means, said back cover means adjoining said retainer means and abutting said backstop to maintain the edge thereof against the top of said armatures where they are supported on said castellated wall of said flux return member;

and a fastener means passing through said back cover in the center thereof and being received in the center of said unitary wire guide; and

heat sink means in thermal contact with the ends of said cores where they join said flux return member for cooling said cores.

4,561,791

ALTERNATE RIBBON FEED MECHANISM FOR FABRIC AND CARBON RIBBON CASSETTES

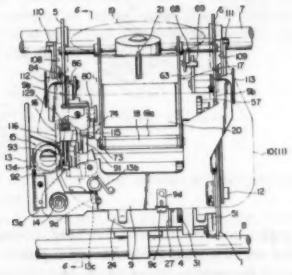
Yoshimitsu Nagashima, Kodaira, Japan, assignor to Silver Seiko Ltd., Tokyo, Japan

Continuation of Ser. No. 575,795, Feb. 1, 1984, abandoned, which is a division of Ser. No. 455,592, Jan. 4, 1983, abandoned. This application Jun. 19, 1985, Ser. No. 746,012

Claims priority, application Japan, Jan. 18, 1982, 57-5023

Int. Cl.⁴ B41J *32/00*

U.S. Cl. 400—208 **4 Claims**



1. A ribbon feed mechanism for a typewriter for alternatively feeding a carbon ribbon and a fabric ink ribbon contained within a cassette, comprising:

a platform for alternatively receiving thereon a cassette containing a carbon ribbon or a cassette containing a fabric ink ribbon, said platform being pivotally mounted relative to a means for printing for pivoting movement between a first, non-print position and a second, print position;

a ribbon feed assembly mounted on a support member, said support member being pivotally connected to said platform for movement relative to said platform between a first position in which said ribbon feed assembly engages a cassette received on said platform and a second, cassette disengaged position, said ribbon feed assembly being mounted on said support member for rotation around an axis and including a toothed member and a gear integrally provided thereon;

means for angularly rotating said ribbon feed assembly around said axis comprising a ratchet wheel connected to said ribbon feed assembly and a pawl element mounted adjacent said ratchet wheel when said support member is in said first cassette-engaging position, said pawl element being engageable with said ratchet wheel for angularly rotating said ribbon feed assembly around said axis;

means connected to said support member for urging said support member and said ribbon feed assembly to a position in which, when a carbon ribbon cassette is received on said platform, said toothed member extends into the carbon ribbon cassette through an opening formed in said carbon ribbon cassette and is engaged with a carbon ribbon within the carbon ribbon cassette so as to feed the carbon ribbon upon an angular rotation of said ribbon feed assembly whereas, when a fabric ink ribbon cassette is received on said platform, said gear is engaged with a gear member of a ribbon feeding arrangement on the fabric ink ribbon cassette so as to allow a fabric ink ribbon within the fabric ink ribbon cassette to be fed by said ribbon feeding arrangement; and

first and second cams mounted for rotation about a common cam axis, said first cam engageable with a first cam follower connected to said platform for moving said platform between said print and nonprint positions, a second cam follower pivotally mounted intermediate its ends and having a first end engageable with said second cam, the other end of said second cam follower defining said pawl element for engagement with said ratchet wheel for angularly rotating said ribbon feed assembly.

4,561,792

PAPER TRANSPORTATION DEVICE FOR PRINTERS WHICH USE REEL PAPER, WITH ONE PAPER PRESSURE ROLLER

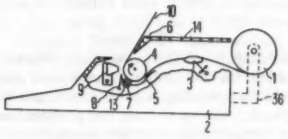
Martin Behrens, Munich, and Walter Stöberl, Holzkirchen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 3, 1983, Ser. No. 548,543

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1982, 3240914

Int. Cl.⁴ B41J *15/16*

U.S. Cl. 400—618 **15 Claims**



1. A paper transportation device for printers using a continuous web of paper supplied from a feed roll, said device comprising:

(a) a platen roller;

(b) a single, barrel-shaped paper pressure roller arranged to elastically contact said plater roller at approximately the center thereof;

(c) means for driving said platen roller and said paper pressure roller such that the peripheral speed of said paper pressure roller is at least as great as that of said platen roller;

(d) a paper guidance plate surrounding a portion of said platen roller and forming a guidance channel therewith, said paper guidance plate extending from approximately the position of said paper pressure roller around said platen roller with as large as possible an angle of loop; and

(e) paper steering means, arranged ahead of said platen roller as seen in the forward direction of paper travel, for maintaining tension in, and laterally guiding said web of paper which is passed through said guidance channel and pinched at the nip between said platen roller and said paper pressure roller.

4,561,793

AUTOMATIC WORK CORRECTING SYSTEM

Raymond A. Blanchard, Jr., Freeville, N.Y., assignor to SCM Corporation, New York, N.Y.

Filed Mar. 9, 1984, Ser. No. 586,913

Int. Cl.⁴ B41J *29/26*

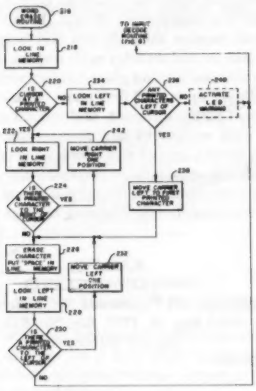
U.S. Cl. 400—697.1 **11 Claims**

1. A word correcting system for an electronic correcting typewriter having a keyboard containing character and func-

tion key actuating means for generating output signals representative of actuated keys, print line memory means for storing an ordered sequence of control signals representing a sequence of actuated keys, print means including a print ribbon for printing a selected character at a print point on a recording medium and a correction ribbon for erasing previously printed characters, means for moving the print point of the print means along a print line of the recording medium including backspacing means for progressively moving the print point leftwardly along the print line, and means for accessing the print line memory means for reading selected locations of the ordered sequence, the word correcting system comprising:

word erase actuating means arranged in the keyboard for selectively generating a word erase command signal; and

word erase control means responsive to said word erase command signal for causing the accessing means to read stored control signals in the print line memory means for initiating an automatic word erasing sequence causing all characters of a previously printed word to be erased after the operator has backspaced the print point of the print means to any previous consecutively printed character located at least one character position further to the left of the last printed character of the word which is to be erased, said automatic word erasing sequence includes



first control means operating the accessing means to read the control signal at the word erase selected position and subsequently reading the control signal at the immediately adjacent higher order position in the print line memory means for moving the print point of the print means one character position to the right in response to reading a character control signal in the selected position and a character control signal in the next right higher order position and said first control means repeatedly operating to stop the print point at the last consecutively printed character of the word in response to reading an absense of a character control signal in the next right higher order position, and

correction control means responsive to the print point reaching the last printed character of the word for operating the accessing means for recalling the character control signal and enabling the correction ribbon for erasing the last printed character whereupon the accessing means is further operated to read the immediately adjacent lower order position for moving the print point one character position to the left in response to reading a character control signal in the left most position and said correction control means repeatedly operating to stop the print point at a last left erased position in response to reading an absense of a character control signal in the next left order position.

4,561,794

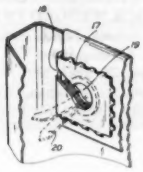
FOLDER FOR PAPERS

John W. Smallwood, 10 Middle Rock Rd., Lake Cathie, New South Wales, 2446, Australia

Filed Mar. 15, 1983, Ser. No. 475,544

Int. Cl.⁴ B42F *13/00, 3/00*

U.S. Cl. 402—75 **6 Claims**



1. In combination: a pin; a folder, and an attachment for the folder enabling removeable fixing of one or more sheets to the folder via said pin; said pin having a generally planar head with a pair of plastically deformable elongated legs extending from one major surface of the head, said legs being generally thin so as to have a greater transverse width than thickness; said attachment comprising a piece of sheet material superimposed on the folder and fixed thereto, said attachment and said folder co-operating to generally enclose a space large enough to receive said head, said space having an open end allowing said head to be located in said space, said open end being at least partially defined by an edge of said piece, a slot extending inwardly from said edge; said slot having a transverse width greater than the combined thickness of the legs adjacent the major surface of said head, but narrower than the transverse width of the legs adjacent said head; an opening in said piece at the inner extremity of the slot, said opening being dimensioned so that in the direction perpendicular to the plane of said piece said head would be prevented from movement through the opening, and wherein said slot allows said head to be located in said space by movement of the legs along said slot; whereby upon being located in said space, said head is captively held by said piece by positioning said legs so as to extend through said opening but then generally transverse of said slot.

4,561,795

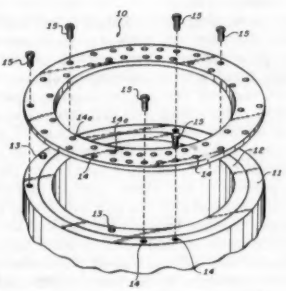
BIASED HARMONIC LOCKING RING

Brian R. Panuska, Phoenix, Ariz., assignor to Sperry Corporation, New York, N.Y.

Filed May 17, 1984, Ser. No. 611,297

Int. Cl.⁴ F16D *1/00*

U.S. Cl. 403—4 **2 Claims**



1. An apparatus to prevent the rotation of two concentric parts comprising a circular ring having planar top and bottom surfaces with a plurality of holes extending through said top

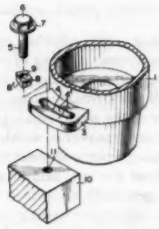
and bottom surfaces, centers of said holes disposed uniformly along circular paths of radius R_1 and R_2, said plurality holes disposed unformly along circular path of radius R_1 is one greater than said plurality of holes disposed unformly along circular path of radius R_2.

4,561,796

TAMPERPROOF CLAMPING CONSTRUCTION WITH BLOCK WEDGED IN SLOT

Masanori Hanaoka, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jun. 25, 1981, Ser. No. 277,386
Claims priority, application Japan, Nov. 10, 1980, 55-158754
Int. Cl.[4] F16D *1/00*; F02P *7/02*
U.S. Cl. 403—4 **13 Claims**



1. A construction for clamping together:

(a) a first member, formed with a first plane contact surface to which opens a cylindrical bolt hole formed in said first member to be perpendicular to said first plane contact surface, and

(b) a second member formed with a second plane contact surface and an elongated slot which is of the general form of a circular arc and is defined by two opposing inner side walls extending along said second plane contact surface, said elongated slot opening from said second plane contact surface to the side of said second member remote from said second plane contact surface;

(c) contact together of said first member and of said second member being possible in any one of a range of relative positions, with said first plane contact surface of said first member opposing and contacting said second plane contact surface of said second member and with the open end of said bolt hole opposing said elongated slot, comprising:

(d) a bolt comprising a head portion and a shank portion connected with said head portion at one end thereof and having a threaded free end portion at the other end thereof, said shank portion of said bolt passing through said elongated slot;

(e) a block member, located at least partly within said elongated slot, formed with a cylindrical through hole through which said shank portion of said bolt passes as closely fitted with no substantial clearance left therebetween, said bolt exerting pressure on a part of said block member remote from said first member so as to urge said block member along the central axis of said bolt in the direction towards said first member when said bolt is tightened towards said first member by the threaded free end portion of the shank portion thereof being either directly screwed into said bolt hole of said first member or threadly engaged by a nut therearound and supported by said first member, said block member being formed with two outer side walls and being positioned with respect to said elongated slot so that said two outer side walls extend generally along the length of said elongated slot, each of said two outer side walls opposing and being in contact with a corresponding inner side wall of said elongated slot;

(f) atleast one of said four side walls being inclined with respect to said central axis of said bolt, so that the part of said inclined side wall which is closer to said first member is closer to said central axis of said bolt than is the part of said inclined side wall which is further from said first member;

(g) the thickness and the profile of said block member in the section across said elongated slot, and the width and the profile of said elongated slot in the section across said elongated slot, being such that without deformation of said block member or of said second member, it is not possible to displace said block member through said elongated slot along the central axis of said bolt in the direction towards said first member so far as to allow said block member to come into contact with said first member;

(h) the tightening up of said bolt wedgingly urging said block member towards said first member and into said elongated slot and forcing said two outer side walls of said block member each against its corresponding inner side wall of said elongated slot;

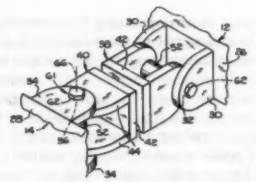
(i) whereby, when said bolt is tightened up, said second member is urged against said first member with said second plane contact surface of said second member; and the engagement of said two outer side walls of said block member against their corresponding inner side walls of said elongated slot, the engagement of said shank of said bolt with said cylindrical through hole in said block member, and the engagement of said shank of said bolt with said first member through said bolt hole formed therein fixing said second member with respect to said first member, so that said second plane contact surface is prevented from sliding upon said first plane contact surface, while, when said bolt is loosened, said second member is free to move with respect to said first member in a rotational fashion about a central axis which is the central axis of said arc which is substantially perpendicular to said first and second plane contact surfaces of said said first and second members, respectively, in sliding contact with each other.

4,561,797

UNIVERSAL CLEVIS

Byron D. Aldridge, 104 Pecanwood Dr., Natchez, Miss. 39120

Filed Sep. 26, 1983, Ser. No. 535,585
Int. Cl.[4] F16D *3/00*
U.S. Cl. 403—58 **2 Claims**



1. A universal clevis for connection between leading and trailing equipment units, the units being adapted for moving along a line establishing a longitudinal direction, and the units having rigid frames, comprising,

a pair of frame lugs rigidly secured to each the rear of the leading unit and the front of the trailing unit, those of each pair being spaced along an axis and the axes being disposed vertically and horizontally respectively,

a single clevis unit including a pair of knuckles of rigid construction, each including a base element and a pair of spaced clevis lugs,

said knuckles being mounted in respective pairs of said frame lugs with said clevis lugs parallel with said frame lugs, and said knuckles substantially filling the space between respective pairs of frame lugs, and the knuckles being piv-

oted therein on the respective ones of the vertical and horizontal axes,

transverse pins so mounting said knuckles for corresponding pivoting movements, about said axes,

said knuckles having their base elements extending and positioned longitudinally outwardly from said frame lugs and being in close juxtaposition, to each other,

said clevis unit including a longitudinal pin extending through and interconnecting said base elements, enabling rotation of said knuckles independently about that longitudinal pin, and

said longitudinal pin being dimensioned longitudinally relative to said knuckles as to enable longitudinal play between said knuckles along said longitudinal pin,

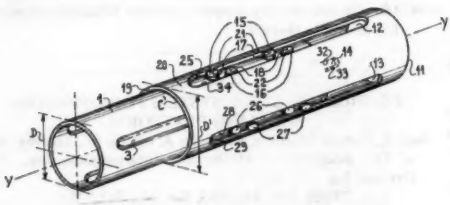
said universal clevis forming with said rigid frames a connection that is rigid except for pivoting movements of said knuckles about said axes, movement of said knuckles toward and from each other along said longitudinal pin, and rotational movement of said knuckles about said longitudinal pin.

4,561,798

TELESCOPIC CYLINDRICAL TUBE COLUMN

Alain Elcrin, and Edmond Chambron, both of Paris, France, assignors to Thomson CSF, Paris, France

Filed Feb. 22, 1983, Ser. No. 468,685
Claims priority, application France, Mar. 9, 1982, 82 03940
Int. Cl.⁴ F16B *7/10*
U.S. Cl. 403—109 **4 Claims**



1. A telescopic cylindrical tube column comprising:

a first tube;

a second tube with said first tube fitted therein along a longitudinal axis and having at least three openings parallel to said axis and disposed symmetrically about the circumference of said second tube;

first and second rolling means each fixed to said first tube at points different from their center of rotation to allow adjustment of the position thereof and cooperating with said opening to interconnect said first and second tubes and guide movement of said tubes with respect to each other parallel to said axis, said first rolling means each bearing on one edge of an opening and said second rolling means bearing on the opposite edge.

4,561,799

TORQUE JOINT

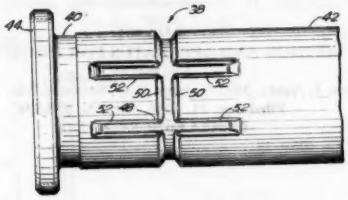
Aldo Arena, Smithtown, N.Y., assignor to Grumman Aerospace Corp., Bethpage, N.Y.

Division of Ser. No. 347,074, Feb. 8, 1982, Pat. No. 4,513,488. This application Sep. 11, 1984, Ser. No. 649,284
Int. Cl.⁴ F16B *1/00*
U.S. Cl. 403—285 **1 Claim**

1. A torque joint, comprising:

an inner tubular member of thin wall construction and having a circumference and an axis;

an outer tubular member of thin wall construction and having a circumference and an axis, said outer tubular member being deformed inwardly into said inner tubular member via a circumferential groove and a set of axially disposed grooves, said circumferential groove and said set of axially disposed grooves both joining said inner and outer tubular members to each other and providing a groove pattern such that each axially disposed groove of said set of axially disposed grooves is parallel to each other and said circumferential groove intersects substantially perpendicular each groove of said set of axially disposed grooves so that said inner and outer tubular members of the torque joint are rigidly held against relative axial, circumferential and bending movement simultaneously.

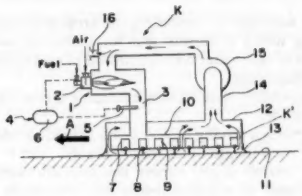


4,561,800

METHOD OF HEATING A ROAD SURFACE AND APPARATUS THEREFOR

Toshiki Hatakenaka; Tetsuo Akiyama, both of Nishinomiya; Shinji Asada, Osaka, and Kunio Shinohara, Nishinomiya, all of Japan, assignors to Chugai Ro Co., Ltd. and Kajima Road Co., Ltd., both of, Japan

Filed Dec. 28, 1983, Ser. No. 566,143
Claims priority, application Japan, Dec. 29, 1982, 57-230129
Int. Cl.⁴ E01L *23/14*
U.S. Cl. 404—79 **5 Claims**



1. A method of subjecting a roadbed surface to air heated by a burner to prepare the surface for repair work comprising:

(a) raising the temperature of air adjacent the burner to a predetermined temperature;

(b) forcing the heated air into contact with the road surface;

(c) collecting the exhausted hot air which has been blown against the road surface; and

(d) returning the exhausted hot air to the burner.

3. In a road surface heating apparatus for applying hot air to an asphalt concrete roadbed surface to soften the same prior to initiating repair work, the combination which comprises:

(a) a supply duct having an upstream and a downstream end;

(b) a burner disposed in said duct;

(c) temperature sensing means disposed in the supply duct downstream from the burner;

(d) fuel control means coupled to the temperature sensing means and the burner for regulating the rates of fuel and air supplied to the burner to maintain the air flowing past the burner at a preset temperature;

(e) a header connected to the downstream end of the duct;

(f) a plurality of nozzle members adapted to be positioned adjacent the roadbed to be heated and connected to the header so that air flowing into the header will be directed through the nozzles and against the roadbed;

(g) a hood extending over the header and nozzle members for trapping the air exiting the nozzles against the roadbed surface; and

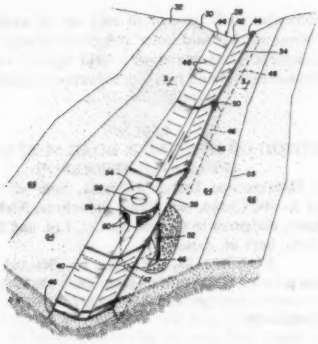
(h) blower means connected between the hood and the upstream end of the supply duct for returning the trapped air to the upstream end of the duct whereby the air heated by the burner is continuously recirculated through the nozzle members past the roadbed surface and back to the burner.

4,561,801

METHOD AND APPARATUS FOR INHIBITING EROSION

Milton J. Nantz, 3602 Naranja Way, Sarasota, Fla. 33582

Filed Jan. 31, 1984, Ser. No. 575,594
Int. Cl.[4] E02B *5/00, 11/00*
U.S. Cl. 405—15 **9 Claims**



1. A structure for inhibiting the erosion of top soil by water flowing down a hillside and for collecting and directing a portion of said water into the subsoil of said hillside, said structure comprising,

an upwardly open trough extending down the grade of said hillside,

said trough having lateral skirts extending along the length of each longitudinal edge thereof,

said lateral skirts buried substantially vertically in the ground to a depth below the lowermost trough depth measured transversely,

said skirts and said trough being impervious to water and sealed together in watertight fashion,

at least one dry well retention basin extending through a portion of said trough,

said basin having its lower portion extending below said trough into a pit formed into the ground,

said basin having a hood section extending upwardly from said trough and provided with peripheral inlets arrayed to receive water flowing down the trough and directing the water into the subsoil at the bottom of said basin.

4,561,802

ASSEMBLY OF CONDUCTOR GUIDES FOR OFFSHORE DRILLING PLATFORM

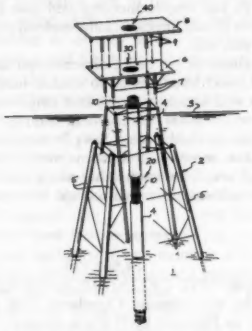
Juan J. Campo, Metairie, La., assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Dec. 19, 1983, Ser. No. 562,546
Int. Cl.[4] E02B *17/00*
U.S. Cl. 405—195 **10 Claims**

1. A conductor guide arrangement for conductors of an offshore well platform having a jacket comprising:

a pile extending from a sea bed to above a water level over the sea bed;

a plurality of center posts connectable end to end of disposition in the pile for positioning a plurality of conductors in the pile, at least one frame structure connected at an end portion of each of said center posts defining a plurality of alignable passages for the plurality of conductors, at least one of said frame structures having a plurality of plate spokes extending radially outwardly of said respective center post a distance in a plurality of radial directions respectively which is less than a radius of the pile so that said frame structure can fit inside the pile, and a plurality



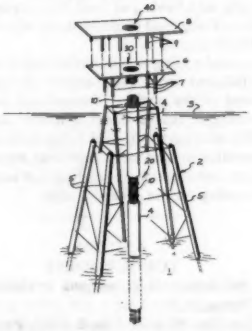
of support brackets removably connectable to at least some of said plate spokes to increase radius of each spoke to which a support bracket is connected so that it is greater than the radius of the pile to rest on a top edge of the pile and thereby support portions of said guide means for assembly thereof.

4,561,803

CONDUCTOR GUIDE SYSTEM FOR OFFSHORE DRILLING PLATFORM

Juan J. Campo, Metairie, and John A. Crutti, Sr., Harvey, both of La., assignors to McDermott International, Inc., New Orleans, La.

Filed Dec. 19, 1983, Ser. No. 562,545
Int. Cl.[4] E21B *7/12;* **E02B** *17/02*
U.S. Cl. 405—224 **14 Claims**



1. A conductor guide arrangement for an offshore well platform having a jacket and at least one upper deck and at least one lower deck connected to the jacket comprising:

a pile extending from a sea bed to above a water level over the sea bed;

first guide means disposed in and supported by the pile for positioning a plurality of conductors in the pile;

second guide means associated with the at least one lower deck and defining a plurality of passages therethrough for positioning said plurality of conductors, said second guide means is rotatable to align said passages thereof with the

plurality of conductors during installation and is fixable to the at least one lower deck;

third guide means associated with said upper deck comprising a hub and a plurality of beam members extending radially outwardly of said hub and defining a further plurality of passages therethrough for alignment with said passages of said second guide means, said third guide means being rotatable to align said further passages with said passages of said second guide means during installation and being fixable to said upper deck;

means defining an opening in the upper deck and supporting said radial beam members for permiting rotation of said third guide means with respect to the upper deck;

hatch means comprising a plurality of substantially trianglar sector-shaped hatches removably connected to said radial beams for covering said passages; and

a plurality of seat plates connectable to said hatches and connected to each of said radial members for supporting said hatch means.

4,561,804

EARTH RETAINING METHOD

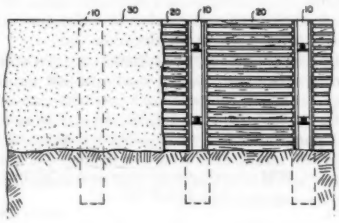
David E. Weatherby, Rockville, Md., assignor to Schnabel Foundation Company, Bethesda, Md.

Continuation-in-part of Ser. No. 192,695, Oct. 1, 1980, Pat. No. 4,369,004. This application Jan. 14, 1983, Ser. No. 457,946

The portion of the term of this patent subsequent to Jan. 18, 2000, has been disclaimed.

Int. Cl.[4] E02D *29/02*

U.S. Cl. 405—262 **16 Claims**



1. A method of constructing a wall for retaining an earthen mass comprising the steps of:

installing a plurality of laterally spaced sheet piles in the ground along the predetermined position of the wall to be constructed;

excavating a first stage of earth adjacent said piles and said earthen mass to a depth where the cut will stand without caving;

installing temporary earth retaining means between said piles against the exposed face of said earthen mass;

repeating said excavating and temporary retaining steps sequentially in descending stages until a depth is reached where a row of tiebacks is required to stabilize the earthen mass;

installing and anchoring a row of tiebacks in said earthen mass and connecting said tiebacks to said piles;

repeating said excavating and temporary retaining steps sequentially in descending stages, and repeating said tieback installing, anchoring and connecting steps for sequentially descending rows for the full height of said earthen mass;

placing a matrix of reinforcing bars adjacent said piles and said temporary earth retaining means and connecting said matrix to said piles; and

placing concrete against said piles and said temporary earth retaining means to encase said reinforcing bar matrix and form a permanent tied back wall.

4,561,805

FORAGE BLOWER

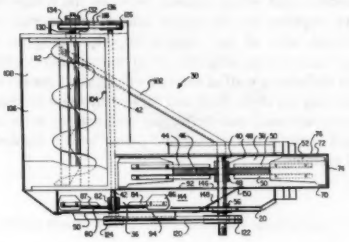
Jacques Laliberté, Marianne, and Gabriel Choinière, Quebec, both of Canada, assignors to B & R Choiniere, Ste-Therese, Canada

Filed Jul. 21, 1983, Ser. No. 515,973

Claims priority, application Canada, Jul. 11, 1983, 432189

Int. Cl.[4] B65G *53/48*

U.S. Cl. 406—71 **2 Claims**



1. An improved forage blower comprising a frame, a first paddle wheel type impeller vertically disposed on said frame and a second paddle wheel type impeller, each impeller having a rotor with a radius and a diameter and with paddles on a rotatable shaft, and a cylindrical housing defining a chamber around the associated rotor with a lateral forage inlet and a tangential forage outlet, said first impeller being relatively small when compared with said second impeller, the shaft of the rotor of said first impeller being horizontal, the shaft of the rotor of said second impeller being horizontal and parallel to the shaft of said first impeller but spaced laterally therefrom a distance not substantially greater than the radius of the rotor of said second impeller, the working speed of rotation of said first impeller being related to that of said second impeller, said forage blower also comprising duct means serially coupling the forage outlet of the first impeller with the forage inlet of the second impeller, air inlet means affording sufficient airstream through said second impeller, a forage receiving hopper, conveying means for transferring forage from said hopper to the forage inlet of said first impeller, the housing of said second impeller having a tangential spout for discharging forage, and transmission means for rotating the shafts of said first and second impellers so as to maintain a pre-determined working speed relationship for said first and second impellers for optimum forage discharge conditions through said tangential spout, said housings of said first and second impellers being contiguous and parallel to each other, said duct means being relatively short when compared with the diameter of said second impeller and extending generally horizontally and transversally to the shaft of said second impeller, for directing forage toward said second impeller via the forage inlet thereof practically in straight line from said first impeller, said conveying means feeding forage to said first impeller via the forage inlet thereof in a first direction generally horizontal and parallel to the shaft of said first impeller across the path of travel of the paddles of said first impeller for breaking up forage into discrete elements and particles and for accelerating same toward the forage outlet of said first impeller, said forage outlet of said first impeller being tangential and disposed about a quarter of a circle downstream from the forage inlet of said first impeller and feeding directly into the forage inlet of said second impeller via said duct means in a second direction generally horizontal and transverse to the shaft of said second impeller, said forage inlet of said second impeller being a lateral opening through the housing of said second impeller adjacent the path of travel of the paddles thereof and being disposed about a quarter of a circle upstream from said tangential spout, said first and second impellers rotating in the same direction whereby accelerated forage elements and particles flowing through the forage outlet of said first impeller and through said duct means enter into said second impeller

through the forage inlet thereof at an acute angle relative to the direction of travel of the paddles of said second impeller at that point, to be further accelerated in said second direction by the paddles of said second impeller upwardly toward said tangential spout, said housing of said second impeller comprises a planar wall which constitutes a partition between said duct means and said housing of said second impeller, wherein said duct means has a main portion which is of generally constant cross-section and which extends between the forage outlet of said first impeller and the forage inlet of said second impeller, said forage inlet of said second impeller being an opening through said planar wall, said duct means also comprising a vertical deflecting wall at the end of said duct means adjacent said opening for deflecting said forage into said second impeller via said opening, said deflecting wall making an acute angle with said opening and joining said planar wall at the distal edge of said opening.

4,561,806

VERTICAL SINGLE FILER CONVEYOR SYSTEM

Ronald A. Lenhart, Lakewood, Colo., assignor to Precision Metal Fabricators, Inc., Arvada, Colo.

Continuation-in-part of Ser. No. 462,394, Jan. 31, 1983, abandoned. This application Sep. 19, 1983, Ser. No. 533,225

Int. Cl.⁴ B65G *51/00*

U.S. Cl. 406—88 **12 Claims**

1. Air operated material handling apparatus for the transport of light-weight, upright, cylindrical objects in a wide mass at an upstream location at an ever increasing velocity into a smaller width at a downstream location, along a centerline of said apparatus, said apparatus comprising:

a table having at least three zones extending from said upstream location to said downstream location and having a surface, side edges and an underside with a prearranged pattern of flotation air jets, wherein said air jets are in rows, said rows being spaced laterally inward from said side edges, and said air jets are in said surface slanted in a downstream direction and communicating said surface and said underside of said table;

a plenum connectable to a source of air under pressure and attached to said underside of said table surface;

a vertical side along each edge of said table, said sides converging toward each other in the downstream direction;

a row of acceleration jets, which are larger in size than said flotation air jets but smaller in size than the spacing between adjacent rows of said flotation air jets, located in said table adjacent to and in spaced parallel relation to each converging side of the table to form two converging rows of acceleration jets; and

means to provide an incrementally increasing volume and velocity of air through said acceleration air jets between each of said three zones from said upstream location to said downstream location to accelerate and longitudinally separate the objects as they move along the table from said upstream location to said downstream location so that the converging of said sides coacts with the acceleration jets to converge the longitudinally separated objects in a prearranged pattern having a lesser number object width than said mass.

4,561,807

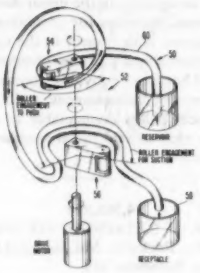
PUSH-PULL MATERIAL TRANSPORT SYSTEM FOR IMPROVED TWO-PHASE FLOW

Gernot R. K. Hilse, Woodinville; Michael J. Intlekofer, and David C. Auth, both of Bellevue, all of Wash., assignors to Advanced Technology Laboratories, Inc., Bothell, Wash.

Filed Nov. 3, 1983, Ser. No. 548,378

Int. Cl.⁴ B65G *53/30*

U.S. Cl. 406—99 **6 Claims**



1. A push-pull material transport system for moving debris-laden fluids from a first location to a second location comprising:

(a) a conduit for transporting the fluid from said first location to said second location;

(b) pump means comprising a peristaltic pump for moving the fluid through said conduit in a direction whose net flow is toward said second location; and

(c) displacer means for intermittently and periodically imparting a flow direction toward said first location, said displacer means comprised of a peristaltic pump mounted along the longitudinal axis of a common drive shaft with said pump means so as to rotate said pump means and displacer means in a common direction, whereby any debris which is in said fluid will be dislodged from any apertures in said conduit.

4,561,808

POWDER FEED PICKUP DEVICE FOR THERMAL SPRAY GUNS

Mark F. Spaulding, Rockville Center, and Richard A. Goehring, Huntington Station, both of N.Y., assignors to METCO Inc., Westbury, N.Y.

Filed Jun. 4, 1984, Ser. No. 616,642

Int. Cl.⁴ B65G *53/42*

U.S. Cl. 406—118 **25 Claims**

1. A powder feeding system for a thermal spray gun, comprising:

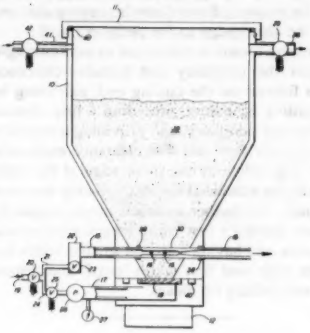
an enclosed hopper for a powder to be thermal sprayed in loose particulate form;

a feed gas conduit adapted to discharge a regulated amount of feed gas under pressure into the hopper; and

a carrier conduit for a carrier gas stream, connected to a carrier gas supply and extending to a point of powder carrier gas utilization;

the carrier conduit having a plurality of powder intake orifices communicating with the carrier conduit at a pickup location situated between the carrier gas supply and the point of utilization, the intake orifices extending into the hopper below the normal minimum level of the powder and having a geometric design and arrangement such that there is no gravity flow of powder therethrough into the carrier gas stream in the absence of a feed gas flow

therethrough, wherein the axes of the intake orifices extend away from the carrier conduit at an acute angle to the



axis of the carrier conduit with respect to the carrier gas stream.

4,561,809

CUTTING TOOL INSERT WITH CHIP BREAKER

Reuven Porat, Nahariya, and Eliezer Nessel, Haifa, both of Israel, assignors to Iscar Ltd., Nahariya, Israel

Continuation of Ser. No. 550,903, Nov. 10, 1983, abandoned, which is a continuation of Ser. No. 205,049, Nov. 7, 1980, abandoned. This application Aug. 20, 1984, Ser. No. 642,190
Claims priority, application Israel, Dec. 4, 1979, 58861
Int. Cl.⁴ B26D *1/00*
U.S. Cl. 407—114 **3 Claims**

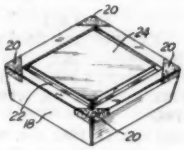
1. A cutting tool insert having a chip breaker arrangement, the cutting tool insert being polygonally shaped having top and bottom surfaces spaced from each other, side surfaces joining the said top and bottom surfaces, cutting edges forming a substantially unbroken line at the junction of the said side surfaces and the said top and bottom surfaces, a chip breaker groove in at least one of the said top and bottom surfaces being shaped in such a manner that any normally directed section plane intersects the groove in three substantially rectilinear portions, the groove being separated from the cutting edges by cutting edge land surfaces and being positioned to shape the chip after cutting and without the further cutting thereof, said groove having an edge constituted by successive, substantially continuous, linear groove edge portions which respectively define between them and the cutting edge, successive land surface regions of successively increased and reduced widths, at least five such successive land surface regions being included in each land surface.

4,561,810

BI-LEVEL CUTTING INSERT

John M. Ohno, Plymouth, Mich., assignor to General Electric Company, Detroit, Mich.

Continuation of Ser. No. 331,375, Dec. 16, 1981, abandoned. This application Dec. 12, 1983, Ser. No. 560,396
Int. Cl.⁴ B23B *27/14*
U.S. Cl. 407—118 **9 Claims**



1. A cutting insert usable with standard tool holders comprising:

a core having upper and lower surfaces and an indentation within its upper surface which forms a recess therewithin;

crystal portions containing a dispersion of super-hard crystals disposed at pre-determined locations on the periphery of said upper surface outside of said recess; and

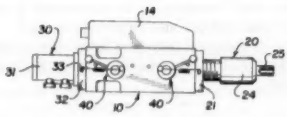
a layer of soft metal or metal alloy bonded to said upper surface inside said recess and upwardly extending beyond said upper surface, said recess being bounded by walls, and wherein there is a clearance between said layer and said walls, wherein said soft metal or metal alloy is easier to machine than said core and dispersion of super-hard crystals, to thereby readily provide parallelism between said upper and lower surfaces.

4,561,811

QUICK CHANGE LATCHING OF COMPONENTS

Robert C. Womack, Dallas, Tex., assignor to AAA Products International, Dallas, Tex.

Filed Sep. 13, 1984, Ser. No. 650,091
Int. Cl.⁴ B23B *35/00*
U.S. Cl. 408—1 R **14 Claims**



10. A method for latching and unlatching components in a joined condition, comprising the steps

mounting a lever on a first component for oscillation about a fixed axis;

mounting a proximal end of a linear tension spring latching member on said lever, for frictionally retarded rotation about an axis eccentric to and parallel to said oscillation axis;

providing a latching pin on a second component disposed, in the joined condition of said first and second components, generally parallel with said oscillation axis and said eccentric axis;

providing said latching member with a latching hook at its distal end for engagement with said latching pin;

moving said lever in a first direction to a stop limit, relative to said first component, to define a lock position of said lever wherein said spring latching member is tensioned to latch said second component, and wherein the tension of said spring latching member maintains said lever in said lock position;

moving said lever in a second direction to release the tension

of said spring latching member, to shift said latching member longitudinally to displace said hook from said latching pin, and to swing said latching member away from said latching pin;

limiting the swinging of said latching member away from said latching pin, during movement of said lever in said second direction, to maintain said latching member in a position to reengage said latching pin of a second component in the joined condition with said first component.

4,561,812

EXTENSIBLE DRILL

Karl H. Lindén, Brickebergsv. 38A, S-702 21 Örebro, Sweden

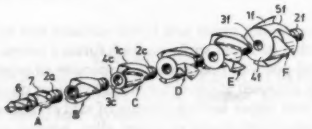
PCT No. PCT/SE82/00327, § 371 Date Jun. 9, 1983, § 102(e) Date Jun. 9, 1983, PCT Pub. No. WO83/01215, PCT Pub. Date Apr. 14, 1983

PCT Filed Oct. 11, 1982, Ser. No. 511,164

Claims priority, application Sweden, Oct. 12, 1981, 8106030

Int. Cl.⁴ B23B *51/08*

U.S. Cl. 408—225 **8 Claims**



1. An extensible drill assembly for drilling holes of different diameters with the same assembly comprising:

(a) a front drill member;

(b) a plurality of rear drill members having different drill diameters;

(c) the front drill member including at least one cutting portion extending peripherally and axially thereof and means for detachably connecting the front drill member to one or more rear drill members;

(d) each rear drill member including first means for detachably connecting one end thereof to either the front drill member or another rear drill member and second means for detachably connecting the other end thereof to either a drilling machine or another rear drill member, whereby the first and second detachable connection means permit the rear drill members to be connected to each other in any desired number and combination; and

(e) the connected drill members being of stepwise increasing diameters from the front drill member to the last rear drill member.

4,561,813

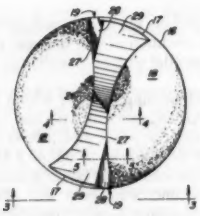
DRILL

Lee A. Schneider, Bettendorf, Iowa, assignor to M. A. Ford Mfg. Co., Inc., Davenport, Iowa

Filed Jun. 6, 1983, Ser. No. 501,217

Int. Cl.⁴ B23B *51/02*

U.S. Cl. 408—230 **4 Claims**



1. A drill bit having a shank, a cutting end with a chisel edge, and a flute length connecting the shank and cutting end, the flute length having at least one land forming at least one flute and defining the periphery of the drill, characterized in that,

cutting lip means is formed on the cutting end and extends from the chisel edge to the periphery; and

strengthening means is connected to said cutting lip means adjacent the periphery and includes clearance surface means formed on the cutting end, extending back from said cutting lip means, providing a first clearance angle adjacent the periphery, and providing a second clearance angle greater than said first clearance angle adjacent the chisel edge whereby the outer edge of the cutting lip of the drill has a reduced tendency to chip due to its greater thickness, and further includes margin means formed on the land, having a first width length adjacent said cutting lip means, and having a second smaller width length contiguous with said first width length and disposed away from said cutting lip means.

4,561,814

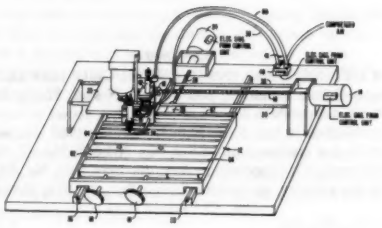
MECHANICAL TOOL MANIPULATING METHOD AND APPARATUS

William V. Dahlgren, Jr., 240 Dolores, Apt. 138, San Francisco, Calif. 94103, and Edward W. Claire, 5332 Shafter Ave., Oakland, Calif. 94618

Filed Jul. 9, 1981, Ser. No. 281,602

Int. Cl.⁴ B23C *1/06*; B23Q *1/26*

U.S. Cl. 409—80 **14 Claims**



1. A mechanical tool manipulating apparatus of the type used in computer controlled tool manipulating systems wherein a tool is manipulated with respect to a workpiece which is supported by a table, comprising:

first positioning means for positioning the tool along a first axis;

second positioning means for positioning the table along a second axis, the first axis being orthogonal to the second axis so that the workpiece is operated upon by controlling the position of the tool along the first axis and the position of the table along the second axis; and

means for providing lineal tracking of the tool and table including

a plurality of slides having cylindrical cross-sections positioned parallel to the axis of each positioning means;

a plurality of "v" wheels which are coupled to the tool and to the table, each "v" wheel positioned to roll along a corresponding slide; and

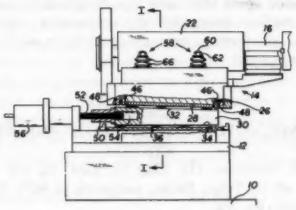
means for elastically preloading the "v" wheels against the slides;

wherein the tool is coupled to the first positioning means by a support structure, and a plurality of "v" wheels are mounted to the support structure, and further wherein the preloading means comprise a plurality of fingers of material upon each of which is mounted a "v" wheel, each finger being formed in the support structure and the table by cutting a kerf therein.

4,561,815
MACHINE TOOL ADJUSTMENT

David J. Trevarrow, Horton, Mich., assignor to Schrader Machine & Tool, Inc., Hanover, Mich.

Filed Apr. 25, 1984, Ser. No. 603,720
Int. Cl.[4] B23C 1/00; B23Q 1/08
U.S. Cl. 409—227 6 Claims

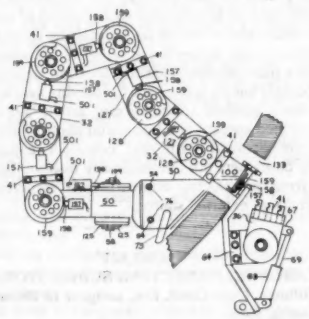


1. An adjustable slide for a machine tool wherein the machine tool includes a frame, and a slide movably mounted upon the frame, the improvement comprising, in combination, a first wedge surface defined on the frame, a second wedge surface defined on the slide in opposed spaced relationship to said first wedge surface, a wedge having an axis interposed between said wedge surfaces, said wedge including a first reaction surface in opposed relation to said first wedge surface and a second reaction surface in opposed relation to said second wedge surface, at least one of said reaction surfaces and its opposed wedge surface being obliquely related to said wedge axis, anti-friction bearings interposed between said opposed wedge and reaction surfaces, a threaded shaft parallel to said wedge axis received within a threaded bore defined upon said wedge, an actuator operatively connected to said threaded shaft for rotating said shaft and adjustably positioning said wedge between said wedge surfaces to adjust the spacing between the slide and the frame, tension rods interposed between the slide and frame, and compression springs mounted upon said tension rods biasing the slide in the direction tending to decrease the spacing between said wedge surfaces.

4,561,816
REMOTE MANIPULATOR ARM FOR NUCLEAR GENERATOR REPAIR

Billy E. Dingess, P.O. Box 357, Ferrellsburg, W. Va. 25513

Filed Aug. 30, 1982, Ser. No. 412,493
Int. Cl.[4] B25J 3/00
U.S. Cl. 414—4 18 Claims

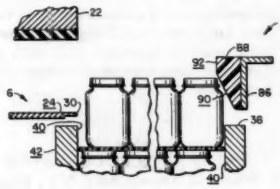


1. An apparatus for remote repair of tubes within a nuclear generator, comprising in combination: a bracket mounted to said generator, an arm mounted to said bracket, and a workhead mounted to said arm, said arm comprising a plurality of linkable arm segments, each said arm segment comprising a rotatable arm housing, an air motor held within said housing, an elbow within said housing coupled to said motor and adapted to rotate said arm housing, a plurality of control and power conduits within said arm housing, and releaseable camlock linkage means mounted to each end of said housing and adapted to couple adjacent arm segments to one another, said workhead comprising a workhead housing, telescope means within said workhead housing adapted to telescope said workhead housing along a first axis, a turret rotatably mounted on said workhead housing, a plurality of tools for tube repair radially mounted to said turret, a tool motor mounted in said turret and adapted to selectively drive any one of said tools, rotation means mounted on said workhead housing adapted to rotate said turret on a second axis perpendicular to said first axis, and swing means mounted within said workhead housing adapted to carry said turret around said first axis.

4,561,817
RETORT CRATE LOADER AND UNLOADER

Barry L. Spletzer, and George Swiatlowski, both of Fremont, Mich., assignors to Gerber Products Company, Fremont, Mich.

Division of Ser. No. 202,218, Oct. 30, 1980, Pat. No. 4,436,470.
This application Aug. 15, 1983, Ser. No. 522,960
The portion of the term of this patent subsequent to Mar. 13, 2001, has been disclaimed.
Int. Cl.[4] B65G 57/20
U.S. Cl. 414—119 4 Claims



1. A retort crate loader/unloader including a conveyor means having a dead plate at one end and means for positioning the upper edge of a retort crate adjacent the outer edge of said dead plate, said retort crate having an open top and adapted to hold a plurality of layers of containers therein, comprising:

a movable sweep ring shaped to overlie a portion of the top edge of said retort crate when in a first position;

means for drawing said sweep ring across said top of said retort crate to a second position, thereby discharging a layer of containers from said retort crate onto said conveyor means; and

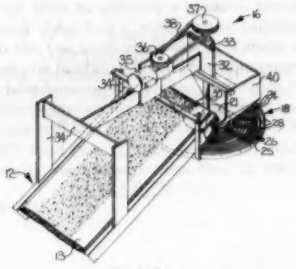
said sweep ring having a vertical surface and an interior surface tapering downwardly and circumferentially outwardly from the vertical surface, said sweep ring positioned to overlie the retort crate top edge when in the first position so only a portion of the tapered interior surface overlies the retort crate interior so that when said sweep ring is used during retort crate loading the vertical surface positions the containers inwardly of the retort crate upper edge to insure that said containers clear the top edge of said retort crate as a layer of said containers is lowered into said retort crate, and said tapered interior surface gathers the containers toward the interior of said retort crate as said containers are raised during unloading said retort crate.

4,561,818

APPARATUS FOR HANDLING BLENDED DRY PARTICULATE MATERIALS

Ernest R. Capps, Charlotte, N.C., assignor to The Royster Company, Norfolk, Va.

Filed Sep. 2, 1983, Ser. No. 529,041
Int. Cl.⁴ B65G *65/32*
U.S. Cl. 414—301 **9 Claims**



7. An apparatus for handling a mixture of dry particulate materials of differing physical properties to form a pile of the mixture in an underlying bin, truckbed, or the like, and characterized by the ability to effectively eliminate segregation of the particles in the resulting pile, and comprising

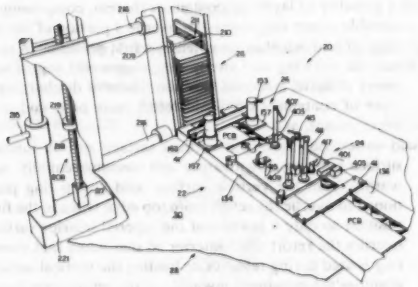
a grate having a generally planar upper surface and a circular peripheral outline and including a central non-perforated circular plate, and a plurality of concentric annular rings disposed coaxially about the outer periphery of said plate, with each of said rings being composed of a segment of a hollow cylinder, and with said rings being radially spaced apart a distance not more than about twice the radial thickness of said rings to define a plurality of concentric annular openings, and with said rings and openings comprising substantially more than one-half the total area of said grate.

4,561,819

FLAT ARTICLE CONVEYOR

Michael V. Wiernicki, Trumansburg, N.Y., assignor to Ironica, Inc., Ithica, N.Y.

Filed Feb. 15, 1984, Ser. No. 580,241
Int. Cl.⁴ B65G *39/10*
U.S. Cl. 414—331 **25 Claims**



1. A conveyor for conveying elongate objects having essentially parallel and essentially straight sides that have a substantially flat bottom edge portion, said conveyor comprising

a first set of a plurality of rotatable wheels, each wheel having a conveying surface for supporting only the bottom position of a conveyed object and said wheels being rotatably mounted on individual, rotational axes that are aligned along a first longitudinal axis; and

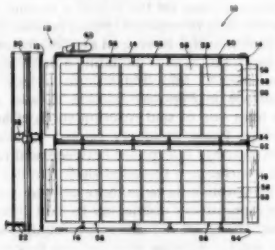
a second set of a plurality of rotatable wheels, each wheel having a conveying surface for supporting only the bottom portion of the conveyed object and said wheels being rotatably mounted on individual, rotational axes that are aligned along a second longitudinal axis that is essentially parallel to and spaced apart from said first longitudinal axis, said conveying surfaces being the only portions of said conveyor in constant supporting, conveying contact with the objects being conveyed.

4,561,820

CAROUSEL AUTOMATIC STORAGE AND RETRIEVAL SYSTEM

William F. Matheny, III; Clay Bernard, II, and William M. Angell, all of Tulsa, Okla., assignors to SPS Technologies, Inc., Newtown, Pa.

Continuation of Ser. No. 910,453, May 30, 1978, abandoned. This application Oct. 3, 1980, Ser. No. 193,757
Int. Cl.⁴ B65G *1/00*
U.S. Cl. 414—331 **15 Claims**



8. An automatic article storage and retrieval apparatus which comprises a continuous track; continuous article storage means supported from said track and movable therearound in a horizontal direction; a plurality of horizontally spaced and vertically extending baskets located on said article storage means, each basket having vertically spaced compartments formed to accept a container; means for driving said article storage means around said track; an elevator mounted in a fixed position adjacent the outside of said track; a carriage mounted in said elevator for vertical movement up and down adjacent said track; a horizontally movable container engaging means mounted on said carriage for movement towards and away from said baskets for placement of one of said containers in and withdrawal of one of said containers from a preselected compartment; and means for moving said container engaging means to a predetermined vertical location adjacent the preselected compartment; said means for driving said article storage means being adapted to move said article storage means a predetermined amount in a horizontal plane to align the preselected compartment with said container engaging means; whereby containers are automatically inserted into and withdrawn from preselected compartments responsive to commands from an external source.

4,561,821

PORTABLE SELF-ERECTING SURGE STORAGE SILO

Bruce Dillman, Cape Coral, Fla., assignor to Bituma-Stor, Inc., Marquette, Iowa

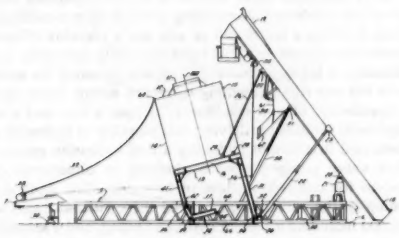
Filed Dec. 20, 1984, Ser. No. 684,342
Int. Cl.⁴ B65G *67/08*
U.S. Cl. 414—332 **6 Claims**

1. A self-erecting portable surge storage silo assembly comprising a bin for storage of paving mix and the like that has front and rear sides which are respectively spaced to the front

and to the rear of a bin axis, a top end, and a bottom end spaced in a downward direction along said bin axis from the top end, a horizontally elongated base frame upon which the bin is supported in an erected position with said bin axis upright and its bottom end elevated and is also supported in a transport position wherein said bin axis is substantially horizontal and the bin has its rear side uppermost and its top end near one end of said frame, and a conveyor elevator comprising an elongated elevator frame that has charging and discharge ends and has, near its charging end, a pivot connection with the base frame, near the other end of the same, about which the elevator is swingable between an upwardly inclined operating position wherein its discharge end is over the top of the erected bin and a transport position which the elevator occupies when the bin is in its transport position and wherein the elevator lengthwise horizontally overlies the base frame with its discharge end near the bottom end of the bin, said silo assembly being characterized by:

A. rear connection means fixed on the base frame, defining a horizontal rear bin swinging axis which is transverse to the bin axis and to the base frame and is intermediate the ends of the base frame;

B. elongated rear bin supporting means rigidly secured to the bin and having on a bottom end thereof a connector element that is spaced to the rear of the bin axis and is spaced a first distance in said downward direction from the bottom end of the bin, said connector element being detachably pivotably connectable to said rear connection means to constrain the bin to swinging about said rear bin



swinging axis between its erected position and an intermediate position wherein the bin axis is inclined upwardly and towards said one end of the base frame and whereat said connector element is connectable to and disconnectable from the rear connection means;

C. front connection means fixed on the base frame defining a front bin swinging axis which is parallel to the rear bin swinging axis and is spaced therefrom towards said one end of the base frame;

D. first front bin supporting means for rigid but detachable securement to the bin to provide a first alternatively selectable connection between the bin and said front connection means whereby

(1) the bottom end of the bin is spaced from said front bin swinging axis by a second distance which is smaller than said first distance,

(2) the bin is constrained to swing about the front bin swinging axis between its transport and intermediate positions, and

(3) the bin is confined in its intermediate position by connection of said connector element to the rear connections means;

E. second front bin supporting means for rigid but detachable securement to the bin to provide a second alternatively selectable connection between the bin and said front connection means whereby

(1) the bottom end of the bin is spaced from the front bin swinging axis by substantially said first distance and

(2) the bin is confined in its erected position in cooperation with the rear bin supporting means in its connection to the rear connection means;

F. axially extensible and retractable cylinder jack means for raising the elevator to its operative position and controlling its descent to its transport position, said cylinder jack means having an upper end pivotally connected to the elevator frame, intermediate the ends thereof, and having a lower end pivotally connected to the base frame between said other end thereof and said front connection means;

G. an elongated tension member having upper and lower ends and having its upper end connected to the elevator frame intermediate the discharge end thereof and the connection thereto of said upper end of the cylinder jack means; and

H. rear and front anchorages on the bin, near said bottom end thereof, to which the lower end of the tension member is alternatively and detachably securable,

(1) the rear anchorage being spaced a substantial distance to the rear of said bin axis so that by securement of the tension member thereto the bin can be swung from its transport to its intermediate position by raising the elevator, and

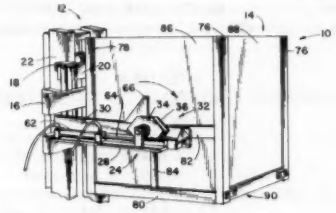
(2) the front anchorage being substantially nearer the bin axis than the rear anchorage so that the bin can be swung from its intermediate to its erected position by again raising the elevator frame.

4,561,822

APPARATUS FOR ROTATING A CONTAINER

John Schmook, 2604 Kells Ct., Tallahassee, Fla. 32308

Filed May 19, 1983, Ser. No. 496,120
Int. Cl.⁴ B65G *65/23*
U.S. Cl. 414—422 **10 Claims**



10. An apparatus for removable engagement with a container and for rotating the container to and from an upright position and a substantially inverted position, comprising in combination:

base means;

a pair of fork members emanating from said base means substantially parallel to one another;

engagement assembly means including a first engagement member and a second engagement member;

means for rotatable connection of said first engagement member relative to one of said fork members;

means for fixed connection of said second engagement member to the side of the container for mating engagement with said first engagement member, said fixed connection means comprising a first container cylindrical stub axle having one end fixedly connected to the container;

said first container cylindrical stub axle fixedly connected to one side of the container which rotatably engages one of said fork members when said first engagement member and said second engagement member are in said aligned adjacent position;

said first engagement member and said second engagement member including mating means for removable engagement together permitting said first engagement member to engage and disengage said second engagement member when moved to and from a non-aligned position and an aligned, adjacent position, respectively, and for fixed

engagement together when in said aligned adjacent position;

first means for rotatable engagement of the other fork member with the other opposing side of the container when said first engagement member and said second engagement member are in said aligned adjacent position, said first rotatable engagement means comprising a second container cylindrical stub axle fixedly connected to the other opposing side of the container which rotatably engages the other said fork member when said first engagement member and said second engagement member are in said aligned adjacent position such that the weight of the container is supported by the pair of fork members by said first and second container cylindrical stub axles;

means for rotating said first engagement member for rotation of the container; and

said mating means of said first engagement member comprising a first plate positioned substantially transverse to the axis of rotation of the container and said mating means of said second engagement member comprising a second plate affixed to the other end of said second cylindrical container stub axle, said mating means comprising means for removable engagement of said plates when said first engagement member and said second engagement member are in said aligned, adjacent position.

4,561,823

WHEELCHAIR TIPPING APPARATUS

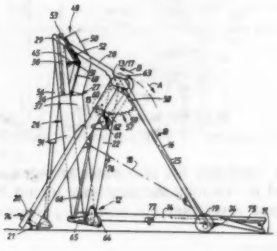
Harry W. Norton, Ludlow, England, assignor to Hatrick Industries Limited, Shrewsbury, England

Filed Dec. 23, 1983, Ser. No. 564,704

Claims priority, application United Kingdom, Dec. 24, 1982, 8236752

Int. Cl.⁴ A61G *5/00, 7/10*

U.S. Cl. 414—678 **46 Claims**



1. An apparatus for tipping wheelchairs, comprising:

a frame;

a carriage mounted on said frame and adapted to receive a wheelchair;

means enabling said carriage to be turned relative to said frame between a lowered position wherein the wheelchair can be wheeled onto and off said carriage and a raised position wherein the wheelchair is tipped in a vertical plane; and

operating means operable to raise and lower said carriage relative to said frame, said operating means including a device operative to prevent said carriage from being lowered relative to said frame except at a controlled rate, said frame being composed of a plurality of frame parts which are normally spaced apart about a first pivot axis, said carriage being composed of a plurality of carriage parts which are normally spaced apart about a second pivot axis parallel to said first pivot axis, and said frame parts and said carriage parts being foldable about said first and second pivot axes respectively into positions wherein said parts lie generally side-by-side with one another.

4,561,824

HYDRAULIC DRIVE SYSTEM FOR CIVIL ENGINEERING AND CONSTRUCTION MACHINERY

Nobuya Okabe, and Fumiki Nakagiri, both of Tsuchiura, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

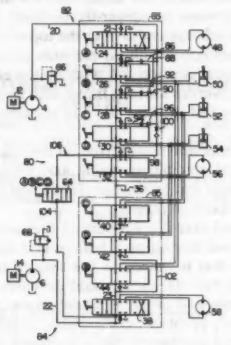
Filed Mar. 2, 1982, Ser. No. 354,386

Claims priority, application Japan, Mar. 3, 1981, 56-29320

Claims priority, application Feb. 24, 1982, 57-28556

Int. Cl.⁴ F15B *11/20*

U.S. Cl. 414—697 **20 Claims**



1. A hydraulic drive system of civil engineering and construction machinery comprising left and right travelling members, a swing, a boom and an arm and a plurality of actuators including at least left and right travelling actuators, a swing actuator, a boom actuator and an arm actuator for activating said left and right travelling members, swing, boom and arm, respectively, of said machinery, at least a first and a second hydraulic circuits for driving said plurality of hydraulic actuators, said first circuit including a first hydraulic pump, and a first valve group having a plurality of directional control valves for controlling flow of hydraulic fluid from the first pump to the actuators associated therewith, and said second circuit including a second hydraulic pump, and a second valve group having a plurality of directional control valves for controlling flow of hydraulic fluid from the second pump to the actuators associated therewith, wherein:

said first valve group includes a first travelling directional control valve for controlling flow of hydraulic fluid to one of the left and right travelling actuators, a swing directional control valve for controlling flow of hydraulic fluid to the swing actuator, a first boom directional control valve for controlling flow of hydraulic fluid to the boom actuator, and a first arm directional control valve for controlling flow of hydraulic fluid to the arm actuator, said first travelling directional control valve being connected to the first pump in a position utmost downstream in the first valve group such that said swing, first boom and arm directional control valves can receive a hydraulic fluid supply from the first pump by taking priority over the first travelling directional control valve;

said second valve group includes a second travelling directional control valve for controlling flow of hydraulic fluid to the other of the left and right travelling actuators and at least one of a second boom directional control valve for controlling flow of hydraulic fluid to the boom actuator and a second arm directional control valve for controlling flow of hydraulic fluid to the arm actuator, said second travelling directional control valve being connected to the second pump in a position upstream of said at least one of the second boom and arm directional control valves in the second circuit so as to be able to receive a hydraulic fluid supply from the second pump by taking priority over said at least one of the second boom and arm directional control valves;

the system further comprises a bypass circuit including a bypass line extending between the second pump and the one travelling actuator, said bypass circuit being effective to allow a hydraulic fluid supply from the second pump to be received by the first travelling actuator when at least one of the directional control valves of the first valve group upstream of the first travelling directional control valve which includes the swing, the boom and arm directional control valves is actuated; and

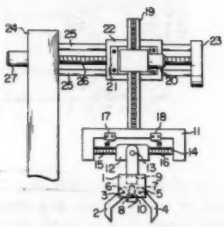
said first arm directional control valve is connected to a seventeenth bypass line connected to the first circuit in a position between the swing directional control valve and the first boom directional control valve, and said first arm directional control valve is also connected to the first pump through an eighteenth bypass line connected to the first circuit in a position upstream of the swing directional control valve, said eighteenth bypass line having flow restricting means mounted therein, whereby said first arm directional control valve is in dual parallel connection with said first boom and swing directional control valves.

4,561,825

APPARATUS FOR FETCHING COMPONENT PARTS

Tomoaki Sakata, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 25, 1983, Ser. No. 478,664
Claims priority, application Japan, Mar. 26, 1982, 57-47164
Int. Cl.[4] B25J *3/00*
U.S. Cl. 414—753 **3 Claims**



1. An apparatus for fetching a component part, the apparatus comprising:

finger means pivotally supporting a plurality of fingers adapted to catch a component part, and having a first detection means for detecting a catch of a component part and a first drive means for opening or closing said fingers;

holding means swingably supporting said finger means, said holding means including a holder frame, guide means fixed on said holder frame, slider means slidably mounted on said guide means to slide in a horizontal direction from an original position along said guide means when a contact angle between said finger means and the component part is not greater than a predetermined angle, means for biasing said slider means so as to enable said slider means to be restored to the original position, and second detection means for detecting said slider means at the end of the sliding motion;

moving means having a second drive means, said moving means supporting said holding means and moving said holding means in the horizontal and vertical directions by said second drive means; and

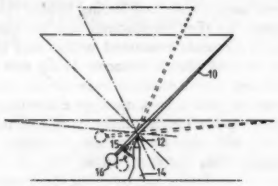
drive control means for controlling said first drive means in response to a signal produced by said first detection means so as to catch said component part, said drive control means controlling said second drive means in response to a signal produced by said second detecting means so as to move said holding means as well as said finger means in the vertical and horizontal directions to thereby again attempt to catch said component part.

4,561,826

VERTICAL AXIS WIND TURBINES

Derek A. Taylor, 85 Waterside, Peartree Bridge, Milton Keynes, England

Filed Mar. 10, 1983, Ser. No. 475,471
Int. Cl.[4] F03D *3/06*
U.S. Cl. 416—19 **12 Claims**



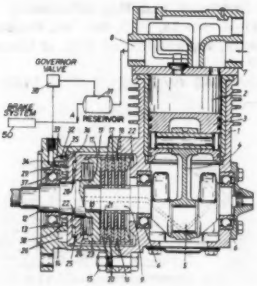
1. A vertical axis wind turbine comprising a support tower, at least one blade mounted in cantilever manner on a pivot hub at the top of said support tower, said at least one blade being without support above the level of the pivot hub and having a blade arm extending freely upward in an inclined manner from the pivot hub, mounting means supporting said at least one blade both for rotation about the vertical axis of the support tower to sweep out a generally conical volume above the tower and also simultaneously for pivoting movement about a horizontal axis passing through said vertical axis such that with increasing wind speed the inclination of the longitudinal axis of the blade arm to said vertical axis of the support tower will increase, said mounting means allowing changes in the inclination of said at least one blade under the action of centrifugal force, and resilient biasing means acting in opposition to the centrifugal forces to control the inclination of said at least one blade in dependence on changes in wind speed.

4,561,827

AIR COMPRESSOR HAVING CONDITION RESPONSIVE CLUTCH CONTROL

Paul Beaumont, Gwent, Wales, assignor to Lucas Industries Limited, Birmingham, England

Filed Mar. 8, 1984, Ser. No. 587,675
Claims priority, application United Kingdom, Mar. 12, 1983, 8306874; Dec. 3, 1983, 8332322
Int. Cl.[4] F04B *49/00, 35/00;* **F16D** *19/00*
U.S. Cl. 417—223 **17 Claims**



1. An air compressor comprising:

a compressor housing having at least one compression chamber and at least one inlet and at least one outlet for said chamber;

inlet and outlet valve means operatively associated with said at least one inlet and outlet to control airflow into and out of said chamber;

piston means operatively disposed in said chamber and coop-

eratively associated with said valve means to compress air in said chamber;
drive means having a drive shaft rotatably mounted in said housing;
clutch means operatively disposed between said drive shaft and said piston means to transmit drive from said drive shaft to operate said piston means;
said clutch means comprising,
a sleeve member in surrounding spaced relationship with respect to the longitudinal axis of said drive shaft, clutch elements contained within said sleeve element, part of said clutch elements being drivingly engaged with said sleeve element to be driven thereby,
a flange on said sleeve member extending radially with respect to the longitudinal axis of said drive shaft,
clutch element engaging means mounted between said clutch elements and said flange, and
a clutch spring device surrounding the longitudinal axis of said drive shaft and acting on one side of said flange and said clutch element engaging means to resiliently urge said clutch elements into engagement so that said drive shaft drives said piston;
an annular axially movable piston surrounding the longitudinal axis of said drive shaft disposed on the other side of said flange;
a thrust means interposed between one side of said annular piston and said other side of said flange to transmit axial force from said annular piston to said flange;
means to apply outlet pressure from the compressor to said annular piston to operate said annular piston to disengage said clutch elements when said outlet pressure reaches a predetermined value to interrupt the transmission of drive from said drive shaft to said piston means;
leakage path means operatively associated with said means to apply outlet pressure to allow said pressure applied to said annular piston to decay in a controlled manner after said predetermined pressure has been reached so that re-engagement of said clutch elements occurs progressively; and
means to pre-load said annular piston on the other side thereof in the direction against the force of said clutch spring device to compensate for wear of said clutch elements and maintain adequate clutch engaging force of said clutch spring device.

4,561,828

PUMP FOR FORWARDING LIQUIDS

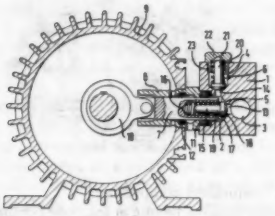
Horst Wolff, and Franz Hani, both of Geretsried, Fed. Rep. of Germany, assignors to Speck-Kolbenpumpen-Fabrik Otto Speck KG, Geretsried, Fed. Rep. of Germany

Filed May 18, 1983, Ser. No. 495,855

Claims priority, application Fed. Rep. of Germany, May 19, 1982, 3218960

Int. Cl.[4] **F04B** *49/08, 39/10, 7/04;* **F16K** *25/00*

U.S. Cl. 417—307 **15 Claims**



1. A high pressure pump for liquids comprising:
a housing defining a pump chamber;
inlet and outlet valves fluidly coupled to the pump chamber;
a drivable displacement member, including a plunger movable to and fro within the pump chamber, for periodically varying the volume of the pump chamber; and
the inlet valve being arranged coaxially to the plunger and including:
a valve seat in the housing;
a movable valve poppet which moves relative to the valve seat, the valve poppet being guided within a blind bore formed in the plunger, said blind bore opening at an end face of said plunger; and
a compression spring supported within the blind bore for exerting a biasing force on the valve poppet which changes in dependence on the displacement of the plunger so to vary the closing force on the inlet valve in dependence on the movement of the plunger.

4,561,829

ROTARY COMPRESSOR WITH TAPERED VALVE PORTS FOR LUBRICATING PUMP

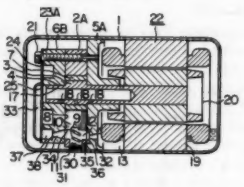
Hiroshi Iwata, Odawara; Masahiro Takebayashi; Akio Sakazume, both of Yokohama; Yoshihisa Uneyama, Tochigi; Kazuo Sekigami, Tochigi; Shigetaro Tagawa, Tochigi, and Masahiko Sugiyama, Tochigi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 2, 1984, Ser. No. 576,337

Claims priority, application Japan, Mar. 10, 1983, 58-38340

Int. Cl.[4] **F04B** *39/02;* **F04C** *18/00, 29/02*

U.S. Cl. 417—368 **1 Claim**



1. A horizontal compressor comprising:
an electric motor, and a compressor element mounted in a case serving concurrently as an oil sump, said compressor element comprising:
a cylinder;
a shaft having a crank attached thereto;
a roller fitted to said crank for eccentric rotation along inner side surfaces of the cylinder;
a vane moving in reciprocatory movement in a bore of the cylinder while abutting against the roller;
two side plates located on opposite sides of the cylinder, one of said two side plates being formed with a suction port for a lubricant and the other side plate being formed with a discharge port for the lubricant; and
a pump chamber defined by a back of the vane, the bore of the cylinder and the two side plates, and
a pumping action according to the reciprocatory movement of said vane following the rotation of said shaft driven by the electric motor introducing a lubricant under pressure from the case through the suction port into the pump chamber and feeding the lubricant under pressure through the discharge port into one end portion of the shaft through a lubricant feed passage, wherein the improvement resides in that:
the suction port is in the form of a tapering port including a small diameter portion directly adjacent the pump chamber and a large diameter portion directly adjacent the case;
the discharge port is in the form of a tapering port including a small diameter portion directly adjacent the lubricant feed passage and a large diameter portion directly adjacent the pump chamber; and
a space is provided at least to the suction port in a position

in which the space is in communication with the small diameter portion of the suction port with said space opening directly into said pump chamber, and wherein the small diameter portion of the suction port is smaller in cross-sectional area than the small diameter portion of the discharge port.

4,561,830

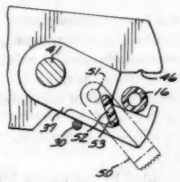
LINEAR PERISTALTIC PUMP

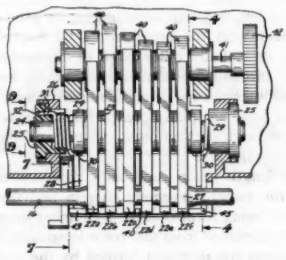
John Bradley, Encinitas, Calif., assignor to IVAC Corporation, San Diego, Calif.

Filed Oct. 1, 1984, Ser. No. 655,758

Int. Cl.[4] F04B *43/12, 45/08*

U.S. Cl. 417—474 **11 Claims**





1. In a linear peristaltic pump having a plurality of cams, a plurality of cam actuated fingers adapted to be moved back and forth by said cams a pressure pad adapted to receive a flexible tube and to urge the flexible tube toward the individual fingers so that when the fingers are sequentially actuated by the cams to contact and close off the flexible tube at a plurality of sequential locations on the tube, fluid is forced along the length of the tube, the improvement comprising:

the plurality of cam actuated fingers pivotally mounted on a common axis so that when actuated by the cams each of said fingers are pivoted about the common axis to sequentially contact and close off the tube, and

the pressure pad being of rigid construction and being firmly mounted to pivot about an axis having the same orientation as the axis on which the fingers are mounted so that essentially no rocking of the pressure pad occurs along the longitudinal axis of the tube when the fingers contact and close off the tube.

4,561,831

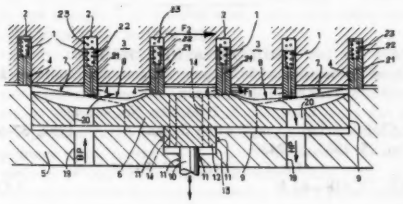
ROTARY HYDRAULIC AXIALLY SLIDABLE VANE DEVICE OF VARIABLE CAPACITY

Josè Mallen-Herrero, Paris; Daniel Leroy, Limay; Urs Zimmermann, Le Chesnay, and Patrice Charlat, Mantes, all of France, assignors to Compagnie de Construction Mecanique Sulzer, Paris, France

Continuation-in-part of Ser. No. 277,316, Jun. 25, 1980, abandoned. This application Apr. 4, 1984, Ser. No. 596,814

Int. Cl.[4] F03C *2/00;* **F04C** *15/04*

U.S. Cl. 418—28 **8 Claims**



1. A rotary hydraulic device of variable capacity with coaxial stator and rotor, the stator comprising at least one circumferentially continuous generally transversal bottom surface with at least one axially recessed portion and the rotor being provided with vanes axially freely slidable therein and biased so as to bear constantly on said continuous bottom surface while circumferentially sliding thereon, said stator comprising a stationary element and a movable element axially slidable therein, said recessed portion being made in said movable element such that the depth thereof can be varied thus providing a device of variable capacity, circumferentially orientated ramp means being provided on said stationary and movable elements respectively thus providing said continuous stator bottom surface with variable composite transition zones between the stationary element and a median portion of the movable element.

4,561,832

LUBRICATING MECHANISM FOR A SCROLL-TYPE FLUID DISPLACEMENT APPARATUS

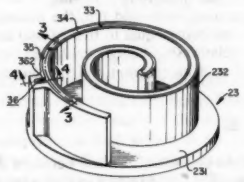
Shigemi Shimizu, Gunma, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Mar. 7, 1984, Ser. No. 586,968

Claims priority, application Japan, Mar. 14, 1983, 58-35404[U]

Int. Cl.[4] F01C *1/04, 21/04, 19/00*

U.S. Cl. 418—55 **4 Claims**



1. In a scroll-type fluid displacement apparatus including a pair of scrolls, each comprising a circular end plate and a spiral wrap extending from one side of said end plate, said spiral wrap having a first groove formed in the axial end surface thereof along the spiral curve, a seal element carried in said first groove, said spiral wraps interfitting at an angular and radial offset to make a plurality of line contacts which define at least one pair of sealed off fluid pockets, driving means operatively connected to one of said scrolls for orbiting said one scroll relative to other scroll and for preventing rotation of

said one scroll to change the volume of the fluid pockets, the improvement comprising a second groove formed in the axial end surface of one of said spiral wraps in communication with said first groove, said second groove extending close to the outer terminal end of said one spiral wrap, said axial end surface of one of said spiral wraps having said second groove forming a contact surface for contacting the circular end plate of the opposing scroll and said second groove supplying lubricating oil to said contact surface, and the cross-sectional shape of said second groove being different from the cross-sectional shape of said first groove to prevent the movement of said seal element in said first groove.

4,561,833

FLUID PRESSURE DEVICE

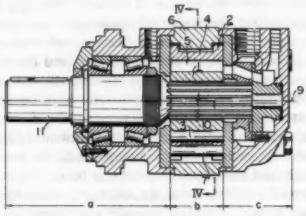
Kiyoji Minegishi, Aichi, Japan, assignor to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

Filed Apr. 6, 1983, Ser. No. 482,485

Claims priority, application Japan, Apr. 7, 1982, 57-56730; Jan. 25, 1983, 58-9430

Int. Cl.⁴ F01C *1/02*; F16H *1/28*

U.S. Cl. 418—61 B **8 Claims**



1. A fluid pressure device of the inner gearing type comprising a first member having an axis and circumferentially arranged external teeth, a second member eccentrically disposed relative to said first member and having circumferentially arranged internal teeth of said first member and an axis adapted to make orbital movement about the axis of said first member, and a stationary ring third member coaxially disposed with said first member and mounting therein for inner meshing relationship with said second member for orbital movement of said second member about the axis of said third member, wherein said inner meshing relationship between said second and third members is provided with a plurality of cylindrical pins circumferentially disposed on one of said second and third members to extend in the axial direction of said members and a plurality of indentations circumferentially disposed on the other of said second and third members and equal in number to said pins, each said indentation having an arcuate profile in meshing engagement with said pin, the diameter of the pitch circle of said pins being equal to that of said indentations, and the following relationship being established between the inner diameter d_2 of said indentation and the outer diameter d_1 of said pin:

$$d_2 = d_1 + 2e,$$

where, e is the eccentric distance between the first and the second members, said one of said second and third members being provided on its peripheral surface confronting that of the other of said second and third members with an annular recess at the axially intermediate portion thereof and annular protrusions at the both axial ends thereof for holding both ends of said pins, while said the other of said second and third members is provided on its peripheral surface thereof confronting that of said one of said second and third members with an annular protrusion at the axially intermediate portion thereof adapted to be received by said recess in said one of said second and third members and annular recesses at the both axial ends thereof for receiving said annular protrusions of said one of said second and third members.

4,561,834

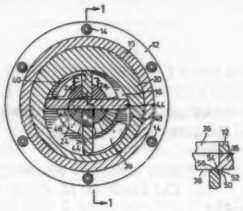
ROTARY VANED PUMPS WITH FIXED LENGTH AND SHEARING KNIFE-EDGED VANES

Werner Poss, Oakville, Canada, assignor to Poss Design Limited, Hamilton, Canada

Filed Jul. 13, 1983, Ser. No. 513,488

Int. Cl.⁴ F04C *2/00, 13/00*

U.S. Cl. 418—150 **8 Claims**



1. A rotary vaned pump comprising:

a pump casing providing at least one pump chamber in its interior between axially spaced axial interior faces and a circumferential interior face;

an axial inlet opening in one of said axial interior faces to the pump chamber interior;

an outlet opening in one of said interior faces from the pump chamber interior;

a pump rotor mounted by the casing for rotation within the pump chamber about a pump rotor longitudinal axis; and

at least one pump vane of fixed length mounted by the pump rotor for rotation with the rotor about the said longitudinal axis;

each fixed length pump vane having its axial edges in engagement with the respective axial interior faces and having its radially outer edge in engagement with the interior circumferential face and forming between itself, the said interior axial circumferential faces and the pump rotor at least one pump compartment receiving fluid entering through the said pump chamber inlet and discharging it through said pump chamber outlet;

the fixed length pump vane being mounted by the pump rotor for radial movement therein and the said pump chamber being formed about a chamber longitudinal axis radially displaced from said rotor longitudinal axis so that each pump compartment formed by the pump vane decreases in volume as the pump vane moves from the said inlet opening toward the said outlet opening and increases in volume as the pump vane moves from the said outlet opening toward the said inlet opening,

the said pump chamber circumferential interior face constituting an interior cam face moving the fixed length pump vane radially in the pump rotor as the rotor rotates with both of the pump vane radial edges always in operative contact with the said interior cam face,

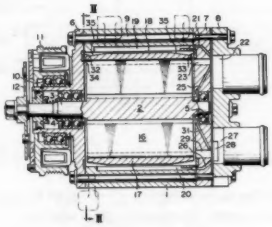
wherein upon rotation of the fixed length pump vane with the pump rotor at least the portions of the radial leading edges of the pump vane which extend beyond the pump rotor pass over the said axial inlet opening, and

wherein the said portions of the radial leading edges that pass over the said axial inlet opening are formed as respective radial shearing knife edges for shear cutting any shear-cuttable solid material entering the pump compartment through the axial inlet opening and engaged by the radial shearing knife edges.

4,561,835
FLOATING ROTARY SLEEVE OF A ROTARY COMPRESSOR

Hiroshi Sakamaki, Utsunomiya; Susumu Sugishita, Hanyu, and Yukio Horikoshi, Kazo, all of Japan, assignors to Nippon Piston Ring Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1984, Ser. No. 611,369
Claims priority, application Japan, May 20, 1983, 58-087616
Int. Cl.[4] F04C *18/348*
U.S. Cl. 418—173 5 Claims

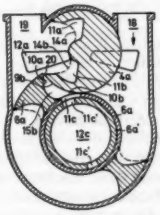


1. A rotary compressor comprising:
a central housing with a cavity therein the inside of said central housing being formed to a true cylinder;
a rotary sleeve rotatably floating, suspended within said housing by means of a pneumatic bearing chamber, whereby the rotary sleeve does not contact the central housing, said rotary sleeve being heated at its inner surface by adiabatic expansion of a gas and cooled at its outer surface by a gas supplied to the pneumatic chamber;
a rotor rotatably housed within said rotary sleeve and a vane free to move into and out of said rotor; and
a taper formed on the outside surface of said rotary sleeve, extending continuously in the circumferential direction from both ends of its axial center, whereby no contact is made between the rotary sleeve and the central housing due to thermal deformation of the rotary sleeve.

4,561,836
ROTARY PISTON MACHINE

Felix Wankel, Bregenzer Strasse 82, D-8990 Lindau/Bodensee, Fed. Rep. of Germany

Continuation of Ser. No. 367,861, Apr. 13, 1982, abandoned.
This application Nov. 1, 1984, Ser. No. 667,072
Claims priority, application Switzerland, Apr. 14, 1981, 2482/81
Int. Cl.[4] F04C *29/00*
U.S. Cl. 418—183 8 Claims

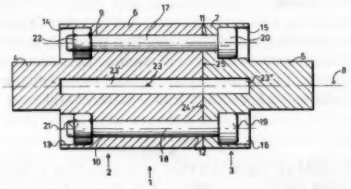


1. A rotary piston engine comprising:
a piston rotor including piston means forming at least one piston member on said piston rotor;
a sealing rotor shaped to define primary recess means forming at least one primary recess through which said piston means pass during relative rotation between said sealing rotor and said piston rotor;
said sealing rotor and said piston rotor being mounted for intermeshing relative rotation therebetween about parallel rotative axes;
a meshing line defined as a locus of points taken relative to said sealing rotor which said piston means follows during movement thereof through said primary recess means;
housing means defining a fluid flow-path for a flowable medium enveloping said rotors;
said sealing rotor having a cylindrical outer surface interrupted by said primary recess means, said primary recess means being defined with terminal edges contiguous with said cylindrical outer surface and extending as uninterrupted straight lines parallel with each other along said cylindrical outer surface; and
secondary recess means forming at least one secondary recess directly contiguous with said primary recess means along said meshing line so as to extend said primary recess means beyond said meshing line to avoid losses due to compressed flows by compression of fluid within said primary recess means by the relative movement between surfaces of said piston means and said sealing rotor, said secondary recess means commencing from a point spaced from said terminal edges of said primary recess means and being located radially inwardly relative to said cylindrical outer surface.

4,561,837
METHOD OF PRODUCING A ROTOR FOR ROTARY SLIDE-VANE VACUUM PUMPS, AND A ROTOR PRODUCED BY SAID METHOD

Hanns-Peter Berges, and Hans-Peter Kabelitz, both of Cologne, Fed. Rep. of Germany, assignors to Leybold-Heraeus, Cologne, Fed. Rep. of Germany

Filed May 15, 1980, Ser. No. 150,034
Claims priority, application Fed. Rep. of Germany, May 22, 1979, 2920626
Int. Cl.[4] B23P *13/00, 15/00*
U.S. Cl. 418—255 11 Claims



4. A rotor for a rotary slide-vane vacuum pump, the rotor comprising two rotor sections and means for fixedly joining the rotor sections together, each of the rotor sections being unitary and comprising a shaft stub with an axis about which the rotor will be rotated, a rotor portion, a contact surface which lies entirely within a single plane which intersects the axis of the shaft stub and which is parallel to the plane of the contact surface of the other rotor section when the rotor sections are fixedly joined together, and a slot across the contact surface which intersects the axis of the shaft stub thereof and aligns with the slot across the contact surface of the other rotor section when the rotor sections are fixedly joined together, whereby the slots may be easily formed before the rotor sections are fixedly joined together and the rotor finished after the rotor sections are fixedly joined together with precise tolerances approximating those obtainable if the rotor had been unitary.

4,561,838

APPARATUS FOR MAKING A HOSE HAVING AN INDEX MARK

Roy W. Olsen, and Curtis H. Bell, both of Lincoln, Nebr., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 543,583, Oct. 19, 1983, which is a division of Ser. No. 299,286, Sep. 4, 1981. This application Jan. 30, 1985, Ser. No. 696,290

Int. Cl.⁴ B29C *17/08*; B29H *3/06*

U.S. Cl. 425—387.1 **2 Claims**

1. Apparatus for use in the manufacture of cured elastomeric hose of the type which includes an indexing mark proximate an end of said hose and that is formed while the hose is mounted on a curved curing mandrel comprising:

(a) an axially elongated mandrel having an overall curved configuration corresponding to that of the hose to be cured thereon, said mandrel having a cavity therein and having an exterior hose-bearing surface for receiving said hose thereon, said mandrel further having a relatively small diametered hole in comparison to the volume of said cavity, said hole extending between said cavity and said exterior hose-bearing surface and corresponding in location to the indexing mark to be formed proximate an end of the hose when an uncured hose is sealingly mounted over said mandrel and said hole to establish a first pressure in said cavity; and

(b) a pressure vessel surrounding said mandrel for providing a pressure chamber about said mandrel, means for introducing a heated fluid into said chamber of said vessel at a pressure greater than said first pressure in said cavity for causing a portion of said uncured hose overlying said hole to be forced through said hole of the mandrel into said cavity to form an indexing mark in said hose.

4,561,839

THERMAL DEBURRING APPARATUS AND METHOD

Gerhard Neumann, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 11, 1984, Ser. No. 609,321

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1983, 3320806

Int. Cl.⁴ F23N *5/20*

U.S. Cl. 431—6 **13 Claims**

1. Thermal deburring apparatus having

a deburring chamber (1) to receive articles to be deburred ;

a mixing block (3) to mix combustible gases including oxygen, and formed with a fluid communication means for said gases with the chamber;

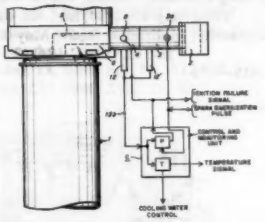
a spark ignition means (3*a*) in the fluid communication means for igniting the combustible mixture of gases;

means for energizing the spark ignition means (3*a*) so that, as the result of a spark at the spark ignition means, the combustible gases are, normally, ignited,

and comprising, in accordance with the invention,

an ignition block (4) located between the mixing block (3) and the chamber (1) and being formed with an internal opening in fluid communication with said fluid communicating means for receiving said gases therein;

means for sensing if, upon energization of the spark ignition means (3*a*), the combustible gases did not ignite;



a glow plug (8) having a glow portion exposed in said opening;

means (P) for energizing the glow plug (8) upon detection of failure to ignite the combustible mixture.

4,561,840

SAFETY DEVICE FOR OIL BURNER

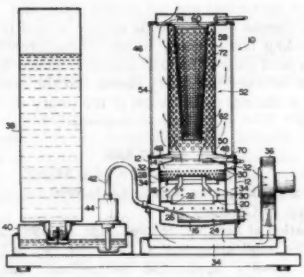
Kazuharu Nakamura, and Yoshimasa Tsuboi, both of Nagoya, Japan, assignors to Toyotomi Kogyo Co., Ltd., Aichi, Japan

Filed Mar. 5, 1984, Ser. No. 586,018

Claims priority, application Japan, Mar. 4, 1983, 58-31861[U]

Int. Cl.⁴ F23N *5/24*

U.S. Cl. 431—22 **9 Claims**



1. A safety device for an oil burner having a burner body and red-heated cylinder means including an outer perforated cylinder and an inner perforated cylinder arranged above said burner body so as to be red-heated, said safety device comprising:

a first flame electrode positioned in a flame formed during normal combustion in said burner body and electrically insulated from said burner body so as to detect a DC flame current through said first flame electrode;

a second flame electrode having a curved outer edge and arranged in said oil burner so that said curved outer edge extends substantially concentrically with said burner body, said second flame electrode circumferentially occupying a part of the cross section of a passage defined by an annular wall for upwardly guiding through said red-heated cylinder means combustion gas produced in said burner body, and said second flame electrode being insulated from said burner body so as to detect a DC flame current through said second flame electrode;

means for applying an AC voltage between said burner body of said oil burner and said first and second flame electrodes; and,

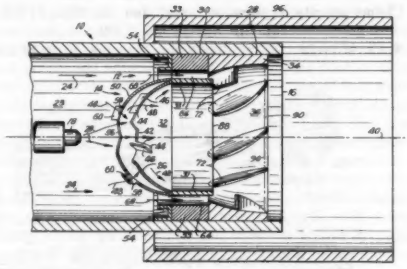
means for extinguishing flames in said burner upon detection of a flame at said second flame electrode.

4,561,841

COMBUSTION APPARATUS

Donald Korenyi, 25 John St., Lynbrook, N.Y. 11563

Continuation-in-part of Ser. No. 523,810, Aug. 16, 1983, Pat. No. 4,464,108, which is a continuation-in-part of Ser. No. 208,887, Nov. 21, 1980, abandoned. This application Jun. 27, 1984, Ser. No. 624,887
Int. Cl.[4] F23Q *3/00*
U.S. Cl. 431—265 19 Claims



1. A combustion apparatus including ignition means, a source of pressurized air, and a source of pressurized atomized fuel, said apparatus comprising, in combination:

a combustor body forming a generally cylindrical combustor chamber having an upstream end and a downstream end and a longitudinal axis extending between said upstream and downstream ends, said body including an upstream end first combustor portion forming a generally dome-shaped first chamber and a downstream end second combustor portion having a generally cylindrical wall forming a second chamber, said first chamber and said second chamber comprising said combustor chamber,

said first combustor portion forming first passage means for passing a first portion of said pressurized air and said pressurized fuel into said said first chamber, said first combustor portion including deflector means associated with said first passage means for directing said first portion of said air in a first rotational direction into a fuel/air mixture of generally helical configuration adapted to being ignited into a helical primary flame vortex about said longitudinal axis,

a plurality of approximately parallel evenly spaced blades extending into said second chamber, said blades having bases connected to said cylindrical wall of said second chamber and forming a plurality of channels therebetween, said blades being adapted to split away the outer portion of said primary flame vortex and to direct said outer portion into a plurality of secondary flame vortexes of generally helical configuration in said channels in a second rotational direction about said primary flame vortex, said blades being disposed approximately perpendicular to said first rotational direction of said primary flame vortex and disposed toward said first rotational direction at an angular tilt measured from said bases of said blades relative to radii extending to a tangential plane at said bases of said blades at said cylindrical wall of said second chamber, and

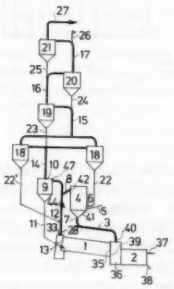
second passage means formed in association with said cylindrical wall of said second combustor portion and with said plurality of blades and being for passing a second portion of said pressurized air into said second chamber into mixture with said plurality said secondary flame vortexes.

4,561,842

APPARATUS FOR BURNING PULVERULENT RAW MATERIAL

Peter B. Nielsen, Copenhagen, Denmark, assignor to F. L. Smidth & Co. A/S, Denmark

Filed Aug. 11, 1983, Ser. No. 522,396
Claims priority, application Denmark, Sep. 2, 1982, 3926/82
Int. Cl.[4] F27B *7/02*
U.S. Cl. 432—106 6 Claims



1. In an apparatus for burning pulverulent raw material, said apparatus comprising:

(a) a preheater having a heating gas inlet, a heating gas outlet, a pulverulent raw material inlet, and first and second preheated raw material outlet ducts for first and second streams of preheated raw material respectively;

(b) a suspension calciner assembly having a combustion gas inlet; a suspension burning chamber provided with inlets for fuel and hot air and with a preheated raw material inlet connected to said first duct of said preheater; a particle precipitator having a kiln gas suspension inlet, a calciner exhaust gas outlet connected to said heating gas inlet of said preheater, and a calcined material outlet duct; a kiln gas duct provided with a material inlet connected to said second duct of said preheater and connecting a kiln gas outlet with said gas suspension inlet of said particle precipitator; and a suspension transfer duct leading from said burning chamber to a sub-assembly comprising said kiln gas duct and said precipitator whereby, in use, said first and second material stream are reunited in suspension and precipitated together in said precipitator;

(c) a kiln having an upper end with a material inlet connected to said calcined material outlet duct of said precipitator and a kiln gas exhaust outlet connected to said kiln gas duct, and a lower end with inlets for fuel and hot air and a burned material outlet; and,

(d) a cooler having a material inlet connected to said lower kiln end, a cooling air inlet, a cooled material outlet, and first and second hot air outlets, connected respectively to said hot air inlet of said burning chamber and to said lower kiln end; the improvement wherein:

(e) said suspension transfer duct is connected to said sub-assembly of kiln gas duct and precipitator downstream of said material inlet of said kiln gas duct.

4,561,843

TRANSFER FLUE WITH MEANS FOR IMPROVING THE FLOW OF GASES

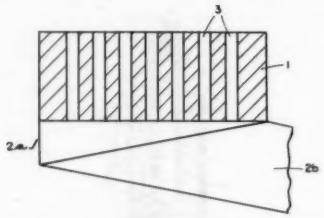
Carl-Heinz Struck, Bochum; Ralf Schumacher, Hagen; Ingomar Kohler, Mulheim, and Gerd-Ullrich Leppert, Iserlohn, all of Fed. Rep. of Germany, assignors to Dr. C. Otto & Comp. G.m.b.H., Bochum, Fed. Rep. of Germany

Filed Jun. 1, 1984, Ser. No. 616,051

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1983, 3320485

Int. Cl.⁴ F24N *7/00*

U.S. Cl. 432—214 **8 Claims**



1. In a transfer flue having a vertical flue part downstream of an upwardly-inclined flue part disposed between a heat-storage means and a combustion chamber and through which pre-heated combustion-supporting media flow, a refractory brick having rectangular side walls disposed in said vertical flue part of said transfer flue, vertical orifices extending through said brick with the sum of the cross-sectional areas of the orifices being from 0.75 to 1.5 times the cross-sectional area of said upwardly-inclined flue part of the transfer flue, and a ratio of greater than 6:1 between the length-to-diameter of the orifices.

4,561,844

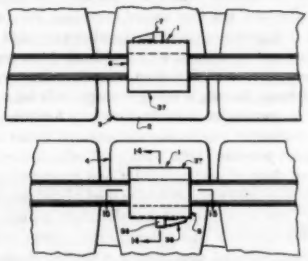
ORTHODONTIC BRACKET

Lyn V. Bates, 3701 Market Ave. N., Canton, Ohio 44714

Filed Oct. 9, 1984, Ser. No. 659,091

Int. Cl.⁴ A61C *3/00*

U.S. Cl. 433—14 **20 Claims**



1. An orthodontic bracket for mounting on the inside surface or lingual of a tooth for retaining an arch wire including:

(a) a one-piece generally U-shaped bracket body having a front wall adapted to be secured to the tooth lingual, an end wall and an outer wall spaced from the front wall forming a vertical arch wire receiving channel therebetween;

(b) a groove formed in the front wall spaced from the end wall and communicating with the channel;

(c) a vertically extending hole formed in and extending completely through the outer wall;

(d) a locking pin having a shaft rotatably mounted in the outer wall hole, a locking plate mounted on one end of the shaft and removably engageable in the front wall groove for locking an arch wire in the channel, and a tab mounted on the other end of the shaft for releaseably securing the locking plate in the front wall groove engaged position;

(e) a slot formed in the end wall of the bracket body and communicating with the shaft receiving outer wall hole, said slot being complementary to the tab means permitting the locking pin to be removed from the bracket body.

4,561,845

ILLUMINATION FOR DENTAL DRILLS

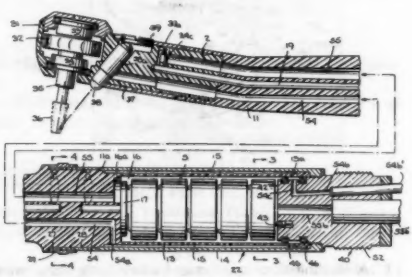
Moshe Meller, 20 Rachel St., Haifa 34402, Israel

Filed Jan. 18, 1984, Ser. No. 571,861

Claims priority, application Israel, Jan. 30, 1983, 67784

Int. Cl.⁴ A61C *1/00, 3/00*

U.S. Cl. 433—29 **19 Claims**



1. A dental hand-piece comprising:

(a) an elongated body member,

(b) a head member at one end of said body member adapted to hold a dental tool having a movable working tip,

(c) connector means at the other end of said body member for coupling the hand-piece to a conventional drill apparatus,

(d) illuminating means on one of said members for illuminating said tip,

(e) said body member including sleeve means defining a generally longitudinally extending generally cylindrical cavity having a diameter of sufficient size so as to be adapted to contain a battery electric power source of a cross-sectional size approximating a major part of the cross-sectional area of said body member and electrically conductive means for connecting such battery with said illuminating means,

(f) said sleeve means having at least one fluid duct extending generally longitudinally therethrough exteriorly of said cavity for supplying fluid to said movable working tip for imparting motion thereto,

(g) said connector means and said one end of said body member each having a solid portion containing at least one bore extending generally longitudinally therethrough and communicating with said duct for conveying fluid around said cavity between said head member and said connector means.

4,561,846

DENTAL PANTOGRAPH

Joseph F. Polizzotto, Huntington Beach, Calif., assignor to Denar Corporation, Anaheim, Calif.

Filed Sep. 2, 1983, Ser. No. 529,160

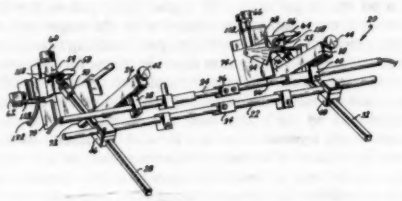
Int. Cl.⁴ A61C *19/04*

U.S. Cl. 433—73 **29 Claims**

1. In a pantograph device having a maxilla cross bow and a mandible cross bow with respective right and left side arms attaching to each of said maxilla and mandible cross bows with said respective mandible side arms moving with respect to said respective maxilla side arms in response to mandibulary movement an improvement which comprises:

a right X axis scale;

a right Y Axis scale;
a right Z axis scale;
a left X axis scale;
a left Y axis scale;
a left Z axis scale;
each of said scales being elongated and including a plurality of reference means located in a spaced arrray along their length;
a right scale engagement means operatively connecting to one of said right side mandible and maxilla side arms, said right side scale engagement means for operatively associating said right X, Y and Z scales with said right side mandible and maxilla side arm to which said right side scale engagement means is operatively connected;
a right scale orientation means operatively connecting to the other one of said right side mandible and maxilla side arms and positioned adjacent to but not in direct contact with said right scale engagement means, the one of said right scale engagement means and right scale orientation means operatively connected to the right side mandible side arm movable with respect to the one of said right scale engagement means and right scale orientation means operatively connected to said right side maxilla side arm in response to mandibulary movement, said right scale orientation means having orthogonal X, Y and Z axes, said right scale orientation means for orienting said right X, Y and Z scales with said right engagement means and for sensing said reference means on said right X, Y and Z scales;
said right X axis scale operatively associated with said right scale orientation means and axially movable with respect



to said right scale orientation means along said X axis and fixed against transverse movement with respect to said right scale orientation means along said Y and Z axes, said right X scale contacting said right engagement means and moving with respect to said right scale orientation means along said X axis in response to movement of said right side mandibulary side arm with respect to said right side maxilary side arm along said X axis;
said right Y axis scale operatively associated with said right scale orientation means and axially movable with respect to said right scale orientation means along said Y axis and fixed against transverse movement with respect to said right scale orientation means along said X and Z axes, said right Y scale contacting said right engagement means and moving with respect to said right scale orientation means along said Y axis in response to movement of said right side mandibulary side arm with respect to said right side maxillary side arm along said Y axis;
said right Z axis scale operatively associated with said right scale orientation means and axially movable with respect to said right scale orientation means along said Z axis and fixed against transverse movemeat with respect to said right scale orientation means along said X and Y axes, said right Z scale contacting said right engagement means and moving with respect to said right scale orientation means along said Z axis in response to movement of said right side mandibulary side arm with respect to said right side maxillary side arm along said Z axis;
a left scale engagement means operatively connecting to one of said left side mandible and maxilla side arms, said left scale engagement means for operatively associating said left X, Y and Z scales with said left side mandible and maxilla side arm to which said left side scale engagement means is operatively connected;
a left scale orientation means operatively connecting to the other one of said left side mandible and maxilla side arms and positioned adjacent to but not in direct contact with said left scale engagement means, the one of said left scale engagement means and left scale orientation means operatively connected to the left side mandible side arm movable with respect to the one of said left scale engagement means and left scale orientation means operatively connected to said left side maxilla side arm in response to mandibulary movement, said left scale orientation means having orthogonal X, Y and Z axes, said left scale orientation means for orienting said left X, Y and Z scales with said left engagement means and for sensing said reference means on said left X Y and Z scales;
said left X axis scale operatively associated with said left scale orientation means and axially movable with respect to said left scale orientation means along said X axis and fixed against transverse movement with respect to said left scale orientation means along said Y and Z axes, said left X scale contacting said left engagement means and moving with respect to said left scale orientation means along said X axis in response to movement of said left side mandibulary side arm with respect to said left side maxilary side arm along said X axis;
said left Y axis scale operatively associated with said left scale orientation means and axially movable with respect to said left scale orientation means along said Y axis and fixed against transverse movement with respect to said left scale orientation means along said X and Z axes, said left Y scale contacting said left engagement means and moving with respect to said left scale orientation means along said Y axis in response to movement of said left side mandibulary side arm with respect to said left side maxillary side arm along said Y axis;
said left Z axis scale operatively associated with said left scale orientation means and axially movable with respect to said left scale orientation means along said Z axis and fixed against tranverse movement with respect to said left scale orientation means along said X and Y axes, said left Z scale contacting said left engagement means and moving with respect to said left scale orientation means along said Z axis in response to movement of said left side mandibulary side arm with respect to said left side maxillary side arm along said Z axis;
right sensor means located on said right scale orientation means for sensing said reference means on said right X axis, Y axis and Z axis scales,
left sensor means located on said left scale orientation means for sensing said reference means on said left X axis, Y axis and Z axis scales;
each of said right sensor means and said left sensor means producing an output in response to sensing said reference means with said output indicating axial movement between said right X axis, Y axis and Z axis scales and said left X axis, Y axis and Z axis scales and said right and left scale orientation means respectively in response to mandibulary movement.

4,561,847

DENTAL ANCHORING FOR ATTACHMENT OF DENTAL PROSTHESES TO CROWNS, PIVOT TEETH, BRIDGES, AND SPLINT ELEMENTS

Helmut Hader, Les Allees 25, 2300 La Chaux-de-Fonds, Switzerland

Filed Apr. 12, 1984, Ser. No. 599,667

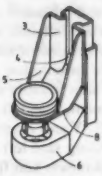
Claims priority, application Switzerland, May 9, 1983, 2509/83

Int. Cl.[4] A61C *13/22*

U.S. Cl. 433—182 **9 Claims**

1. In a dental device for removably supporting an artificial

tooth, comprising a T-attachment in dovetail form having a patrix (1) mounted in a groove formed in the remainder of the teeth; the improvement comprising a matrix (2) having a hollow outer vertical extension serving on the one side as a slide



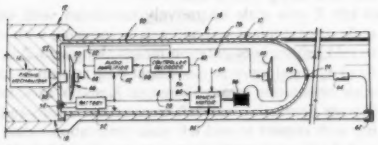
for slidably arranging said matrix in said patrix, and on the other side as a partial female mold for the cast prosthesis, whereby said matrix and prosthesis form a removable unit and whereby said prosthesis and said remainder of the teeth can be positioned in interfitted relation.

4,561,848

ELECTRONIC AMMUNITION FOR SIMULATING LIVE AMMUNITION DETONATION

Charles C. Freeny, Jr., Fort Worth, and Ronald J. Rabin, Mansfield, both of Tex., assignors to Power Technology Partners, Ltd., Oklahoma City, Okla.

Filed Aug. 31, 1983, Ser. No. 528,143
Int. Cl.⁴ F41F *27/00*
U.S. Cl. 434—18 **12 Claims**



1. Electronic ammunition for simulating live ammunition detonation when utilized with an ammunition firing device having a firing mechanism for firing ammunition when triggered, comprising:

a shell having a rearward end, a forward end, and a component space disposed generally between the forward and rearward ends thereof;

an electronic sound assembly disposed in the component space in the shell having the sound of the live ammunition recorded therein (live ammunition sound) and adapted for providing the live ammunition sound in an audibly perceivable form in a play mode of the electronic sound assembly, the electronic sound assembly being conditioned in the play mode in response to receiving a triggered signal;

a firing assembly having a portion engagable with the firing mechanism of the ammunition firing device when the electronic ammunition is loaded in the ammunition firing device and when the ammunition firing device is triggered and another portion adapted to provide a triggered signal to the electronic sound assembly in response to the firing assembly being engaged by the ammunition firing device, thereby conditioning the electronic sound assembly in the play mode; and

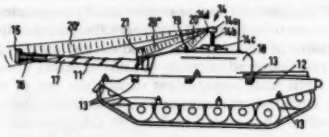
a recoil assembly disposed in the component space in the shell having a portion adapted for receiving the triggered signal from the firing assembly and being adapted to impart a simulated recoil action to the ammunition firing device in response to receiving the triggered signal.

4,561,849

DEVICE FOR SIMULATING COMBAT FIRING BETWEEN COMBAT PARTICIPANTS

Kurt Eichweber, Hamburg, Fed. Rep. of Germany, assignor to Precitronic Gesellschaft fur Feinmechanik und Electronic mbH, Hamburg, Fed. Rep. of Germany

Filed Sep. 21, 1983, Ser. No. 534,296
Claims priority, application Fed. Rep. of Germany, Sep. 21, 1982, 3234949
Int. Cl.⁴ G09B *9/00*
U.S. Cl. 434—22 **14 Claims**



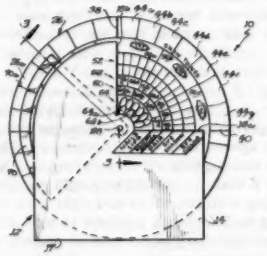
1. A device for simulating firing combat between combat participants each of which is either a weapon carrier, a target object, or both, the device comprising, in association with the weapon carrier, laser transmitter means for transmitting laser pulses to track the position of the target object, optical measurement receiver means for receiving the tracking laser pulses reflected by the target object, analyzer means for analyzing from the reflected laser pulses information concerning hit accuracy, and means for transmitting the hit accuracy information to the target object by coded laser pulses, the device further comprising, in association with the target object, reflector element means for reflecting the tracking laser pulses, at least one optical information receiver means for receiving the coded laser pulses, and means coupled to the optical information receiver means for evaluating the hit accuracy information transmitted by the coded laser pulses, the reflector element means being separate from and located in spaced relationship from the optical information receiver means, at least one display means, and at least one optoelectronic communication link connecting the information receiver means of the target object to at least one of the laser transmitter means of the target object and to the display means of the target object for transmitting data or command signals responsive to the hit accuracy information received by the information receiver means.

4,561,850

COLOR COORDINATOR DEVICE

Vittorio E. Fabbri, 8411 Crystal Springs Rd., Woodstock, Ill. 60098, and Jackie D. Bell, 1595 Bedlington Dr., Barrington, Ill. 60010

Filed Nov. 14, 1983, Ser. No. 551,282
Int. Cl.⁴ A45D *44/00*
U.S. Cl. 434—98 **11 Claims**



1. A color coordinator device for use in the selection of personal cosmetic colors and the like having predetermined relation to the skin and eye colors of the user, said device comprising;

a shield member including a pair of panels defining a pocket therebetween, at least one of said panel having a viewing opening formed therein,

a generally planar color coordinator disc disposed within said pocket and supported for rotation relative to said shield member, said color coordinator disc having on one side thereof a first outer annular peripheral band adjacent its outer peripheral edge defining a plurality of different color segments arranged in predetermined generally arcuate groupings such that the color segments within each grouping represent a different shade or tone of a primary skin color,

said color coordinator disc having a second annular band formed on said one side thereof and defining a plurality of segment areas each identifying a predetermined eye color having predetermined relation with a corresponding arcuate grouping of color segments in said first annular band, each of said eye color segment areas including a plurality of different color samples representative of eye shadow colors compatible with the corresponding eye color,

said color coordinator disc having a third annular band formed on said one side thereof and defining a plurality of segment areas having predetermined relation to a corresponding arcuate grouping of color segments in said first annular band and each bearing indicia relating to a hair tint color suggested for the corresponding arcuate grouping of skin color shades,

said color coordinator disc having a fourth annular band formed on said one side thereof and defining a plurality of segment areas each having a different color sample thereon having predetermined color relation to a corresponding arcuate grouping of skin color shades and representing a color of facial make-up suitable for use by a person whose skin color falls within the range of the corresponding arcuate grouping of skin color shades,

said color coordinator disc having a fifth annular band formed on said one side thereof and defining a plurality of segment areas having predetermined relation to the corresponding arcuate grouping of skin color segments in said first annular band, said segment areas of said fifth annular band bearing color indicia thereon representative of nail polish or lip colors compatible with said corresponding skin color segments,

said viewing opening being sized to enable positioning of said color coordinator disc so that a selected one of said predetermined arcuate groupings in said first annular band and the color segment areas in the corresponding arcuate portions of said second, third, fourth and fifth bands are exposed to facilitate color selections from the various exposed color segment areas,

said color coordinator disc being arranged in arcuate segment areas defined between radial lines which define lines of weakness adapted to enable removal of a selected one or more of said arcuate segment areas.

4,561,851

APPARATUS FOR DEMONSTRATING AND/OR TEACHING ALLEVIATION OF PAIN WITH TRANSCUTANEOUS ELECTRICAL NERVE STIMULATORS

Lloyd A. Ferreira, Princeton Junction, N.J., and Jeffrey S. Mannheimer, Holland, Pa., assignors to Biostim, Inc., Princeton, N.J.

Filed Jun. 20, 1983, Ser. No. 506,116
Int. Cl.[4] G09B *23/30*
U.S. Cl. 434—272 **9 Claims**

1. An apparatus for demonstrating and/or teaching the application of transcutaneous electrical nerve stimulation to a human or animal body for the alleviation of pain at a location thereof which comprises a representation of such a body with a plurality of receptors thereon at different sites on such representation whereat electrodes would be placed for treatments of different pains afflicting a human or animal, a plurality of electronic circuits with means included therein for visually representing the locations of particular pains afflicting the human or animal in response to the operation of related switches, switches for turning on the representations of any of the pains selected, electronic circuitry for visually showing transcutaneous electrical nerve stimulation on the representation of a human or animal at a site near the receptors when a

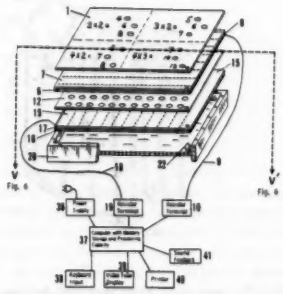
transcutaneous electrical nerve stimulator is connected to such receptors and is activated, and electronic circuitry for cancelling the representation of pain when the T.E.N.S. unit is properly connected to the receptors at the locations where T.E.N.S. electrodes would be applied on a human or animal to treat and diminish or cancel pain at the indicated locations.

4,561,852

COMPUTER ASSISTED TEACHING MACHINE THAT USES TWO ELECTRORESISTIVE SHEETS

J. Richard Harte, 10 W. Concord, Kansas City, Mo. 64112

Filed Sep. 13, 1984, Ser. No. 650,077
Int. Cl.[4] G09B *7/06*
U.S. Cl. 434—339 **5 Claims**



1. A teaching and testing machine that incorporates: an industrial sheet; two electroresistive sheets; a computer and related hardware; and electrical circuitry to link the electrical components;

where the instructional sheet contains questions and a multiplicity of answers with response areas adjacent to said answers;

where said instructional sheet lies over two electroresistive sheets in a parallel plane with said resistive sheets;

where the two said electroresistive sheets are linked to a computer and related hardware by electric circuit means;

where said two electoresistive sheets define X and Y coordinates of a grid by the use of a gradient of electrical resistance that is an intergral part of the substance of each of the two electroresistive sheets;

where each of the two electroresistive sheets normally only make contact with other electroconductive material to result in a switching action when downward pressure is exerted at a response area on an instructional sheet, said pressure also resulting in downward pressure on a top elastic and electroresistive sheet which then contacts underlying electroconductive material to close one or more electrical circuits;

and when this downward pressure at a response area results in the generation of electrical resistances which define the specific X and Y coordinates at which this downward pressure occurred;

where said specific X and Y coordinates are determined by resistances from the intrinsic electrical resistance properties of the electroresistive sheets;

and where it is the incremental resistance values of the electroresistive sheets that form gradients of electrical resistance that can be used to define the X and Y coordinates of a grid pattern on the two electroresistive sheets;

and where electric circuit means sends the information as to the site of downward pressure to the computer for it's memory to evaluate the correctness or incorrectness of the student's responses at different response areas and on different instructional sheets;

and where the computer and related hardward send information back to the student as to the correctness or incorrectness of his or her response choices;

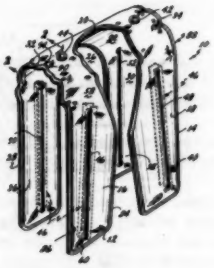
and where the computer also retains this information in its memory for later evaluation of a student's performance, and reporting this performance back to the teacher, evaluator, or tester.

4,561,853

BUOYANCY COMPENSATOR, BLADDER, AND PROCESS OF MANUFACTURE

Mark Faulconer, Costa Mesa, Calif., and Allan R. Langton, Aukland, New Zealand, assignors to U.S.D. Corp, Santa Ana, Calif.

Filed Apr. 18, 1983, Ser. No. 485,735
Int. Cl.⁴ B63C *9/16*
U.S. Cl. 441—106 **6 Claims**



1. A diver's buoyancy compensator having an inflatable cavity formed from major sheets defining at least a portion of the cavity wherein the improvement comprises:

said major sheets on the interior side thereof being bonded within the cavity along an elongated portion thereof by heatsetting a heatsettable material on the interior of one major sheet to the interior of the other major sheet;

said elongated heat-set portions being terminated in an expanded heat-set area to reinforce the ends of the heat-set elongated portions, thereby bonding the interior portions of each sheet to each other within the cavity and forming a bladder internally of the buoyancy compensator;

at least two frontal major channels in the front portion thereof that are each divided by at least one gusset that is heatset to the interior portion of the major sheets which are conformed to provide a yoke therearound;

at least two major channels at the rear thereof divided by a space adapted to receive a backpack; and further comprising,

at least one gusset between the interior surfaces of the major sheets of each major rear channel; and,

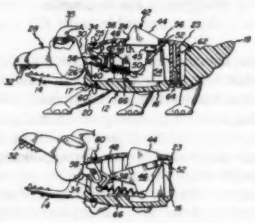
an arcuate shoulder portion having pleats therein that are heatset around the periphery thereof.

4,561,854

CREATURE WITH SNAP ACTION JAW

Francis R. Amici, Northford, and Pietro Piazza, Prospect, both of Conn., assignors to Coleco Industries, Inc., West Hartford, Conn.

Filed Feb. 20, 1985, Ser. No. 703,313
Int. Cl.⁴ A63H *3/24, 3/20*
U.S. Cl. 446—304 **20 Claims**



1. A simulated creature having snapping jaws comprising:

A. a first body member providing an elongated lower body portion and a lower head and jaw portion of a creature, said first body member defining an upwardly opening cavity therewithin;

B. a second body member providing an elongated upper body portion of a creature and defining a downwardly opening cavity therewithin, said second body member having an aperture in its upper surface communicating with said cavity, said first and second body members abutting and being engaged along transversely extending surfaces to provide a body assembly;

C. an upper jaw member on said lower jaw and having a lever arm extending rearwardly into the cavity defined between said body members;

D. pivot means pivotably mounting said lever arm to said body assembly for pivotal motion of said upper jaw member relative to said lower jaw;

E. actuator means for effecting pivotal movement of said upper jaw member upon movement thereof including a manually depressible button portion extending outwardly of said body assembly through said aperture and a cam portion engageable with said lever arm, said actuator means being pivotably mounted in said body assembly for movement between an at rest position wherein said button portion projects outwardly of said body assembly and a pivoted position wherein the cam portion is pivoted downwardly, said cam portion pivoting upon depression of said button portion to cam said lever arm and effect pivotal movement of said upper jaw member from an at rest position abutting said lower jaw to an open position wherein the outer end of said upper jaw member is spaced from said lower jaw; and

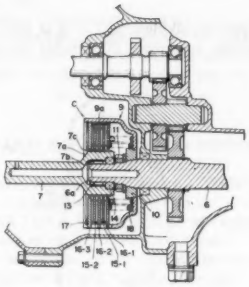
F. biasing means biasing said upper jaw member into the at rest position adjacent said lower jaw and biasing said actuator means and thereby said button portion into an elevated at rest position, said pivot means, biasing means and cam portion cooperating to permit said lever arm to snap back to its at rest position after its movement to the open position and said actuator means to pivot back to its at rest position.

4,561,855

FRICTION CLUTCH

Makoto Kondo, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 9, 1982, Ser. No. 416,308
Claims priority, application Japan, Sep. 11, 1981, 56-143513
Int. Cl.[4] F16D *7/00*
U.S. Cl. 464—47 **13 Claims**



1. A friction clutch for a vehicle, comprising:

a clutch outer member rotatable about a predetermined axis of rotation and provided with at least one trap notch in a circumferential wall thereof;

at least one clutch disc member rotatable about said axis of rotation and having a projection loosely received in said notch;

said projection and said notch being arranged such that said projection is capable of relative movement with respect to said notch within a distance permitted by said notch so that said clutch disc member is capable of substantial relative rotation with respect to said clutch outer member;

at least one friction disc rotatable about said axis or rotation; and

spring means for normally urging said friction disc and said clutch disc member against each other and for permitting said relative movement of said projection with respect to said notch when a torque to be transmitted by said clutch exceeds a predetermined torque.

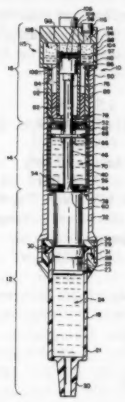
4,561,856

INFUSION PUMP

Ulrich D. Cochran, 11525 Snapper Creek Dr. N., Miami, Fla. 33156

Filed Aug. 18, 1983, Ser. No. 524,338
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—143 **23 Claims**

1. A pump for delivering liquid to an individual in either an automatic basal mode of delivery or a manual bolus mode of delivery, said pump comprising a syringe section including a syringe barrel having a nozzle at one end and a syringe piston in said barrel, an intermediate section mounting a piston rod for axial movement thereof, one end of said rod being associated with said piston for acting on said piston, said intermediate section including timing means for causing delivery of liquid at a contant rate of basal delivery, a drive section at the other end of said pump including a gas spring associated with the other end of said piston rod for acting on same to move said piston rod to move said syringe piston to cause liquid to be delivered from said syringe barrel and bolus control means associated



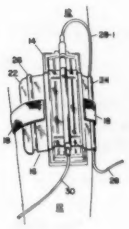
with said drive section for causing a bolus delivery of liquid, overriding the basal mode of delivery.

4,561,857

INTRAVENOUS FILTER RETAINER

Norman L. Sacks, 24502 Kings Rd., Laguna Niguel, Calif. 92677

Filed Mar. 18, 1983, Ser. No. 476,595
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—174 **7 Claims**



1. An intravenous filter retainer assembly, for use with standard I.V. filters of the elongated, generally rectangular type having one substantially flat side, and one side provided with a raised longitudinally extending passageway and with at least one transverse groove, the filter retainer assembly comprising:

a thin piece of medically inert, formed plastic sheet material;

said sheet material being made of semi-rigid material preformed to have (1) a central recessed portion having an inner configuration conforming to the outer configuration of the filter, (2) a generally rectangular raised portion, (3) a rounded central recess to conform to the raised passageway of the filter, and (4) at least one transverse detent to fit into the transverse groove in said filter, to hold the filter to the retainer;

said sheet material having outer side portions which are relatively flat, but are provided with longitudinally extending grooves approximately one-eighth inch in width to accommodate I.V. tubes;

securing tabs cemented onto said side portions of said plastic sheet material; and

foam band retaining strap means free of active adhesive

material for releasable engagement with said securing tabs to hold said retainer onto the body of a patient;

said filter retainer assembly weighing less than one quarter of an ounce;

whereby the use of adhesive tape with its potentially adverse effects on patients is avoided, in holding said filter to the patient.

4,561,858

OSTOMY BAG WITH INTEGRAL BREATHABLE GASKET

Douglas Allen, Jr., Belle Mead, and Eric Flam, East Brunswick, both of N.J., assignors to C. R. Bard, Murray Hill, N.J.

Filed May 3, 1983, Ser. No. 491,256

The portion of the term of this patent subsequent to Feb. 5, 2002, has been disclaimed.

Int. Cl.[4] A61F *5/44*

U.S. Cl. 604—336 **5 Claims**

1. An ostomy bag having a front face provided with a stoma opening therein, a backing of hydrophobic material welded to said front face surrounding said opening, and a skin barrier gasket on the exposed face of the backing, said skin barrier gasket being a polymeric composition comprising a product derived from the generally non-aqueous reaction of an organic polyisocyanate, and a polyoxyalkylene polyol moiety comprising a mixture of a major portion of polyol having a diol functionality and a minor portion of polyol of at least triol functionality, and having incorporated into the polyol moiety prior to the generally non-aqueous reaction of the polyisocyanate and the polyol moiety a hydrophilic filler wherein there is provided a polymeric matrix characterized by the physical encapsulation of the hydrophilic filler within the polymeric matrix.

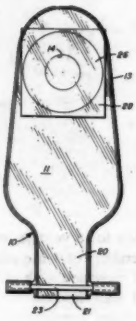
5. An ostomy bag as defined in claim **1**, wherein the polymeric composition comprises a product derived from the generally non-aqueous reaction of an organic polyisocyanate of the formula

$$R(NCO)n$$

where R is selected from the group consisting of aliphatic, alicyclic, aliphatic-alicyclic, and aromatic or aliphaticaromatic hydrocarbon compounds and n is at least 2, and a polyoxyalkylene polyol moiety of the formula

$$R(OH)n'$$

where R is a polyoxyalkylene and n' is at least 2, the polyol moiety comprising a mixture of a major portion of polyol



having a diol functionality and a minor portion of polyol of at least triol functionality, and having incorporated into the polyol moiety prior to the reaction of the polyisocyanate and the polyol moiety, a hydrophilic filler wherein there is provided a polymeric matrix characterized by the physical encapsulation of the hydrophilic filler within the polymeric matrix.

4,561,859

LOW TEMPERATURE AQUEOUS DESULFURIZATION OF COAL

William A. Slegeir, Hampton Bays; Francis E. Healy, Massapequa, and Richard S. Sapienza, Shoreham, all of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 18, 1985, Ser. No. 724,431
Int. Cl.[4] C10L 9/02
U.S. Cl. 44—1 SR 9 Claims

1. A method of desulfurizing coal which comprises treating coal with an effective aqueous amount of titanous chloride.

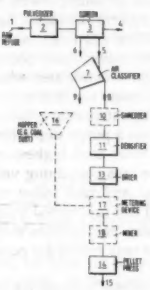
3. The method according to claim 1 wherein the aqueous titanous chloride is utilized at a weight percent of about 2%.

4,561,860

PROCESS AND APPARATUS FOR PRODUCTION OF REFUSE DERIVED FUEL

Brian W. Gulley, Basingstoke; Gilbert J. Williamson, Grimsby; Richard Q. Carmichael, Huntley; David F. Cooke, Wickham, and Roderick Taylor, Bourne End, all of England, assignors to The Secretary of State for the Environment in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Mar. 10, 1981, Ser. No. 242,192
Claims priority, application United Kingdom, Mar. 24, 1980, 8009808
Int. Cl.[4] C10L 5/00; F23G 5/02
U.S. Cl. 44—10 R 23 Claims



1. In a process of producing fuel from raw refuse material comprising the steps of:

subjecting the material to a dry separating step to separate therefrom a light moist combustible fraction having a moisture content not greater than 40% by weight;

subsequently partially compacting the thus separated light moist combustible material in a first densifying step; and

drying the thus separated light moist combustible material, to a moisture content of from 10 to 25% by weight, by passing air through the said material,

the improvement which comprises carrying out said drying step after said partial compaction step whereby said light moist combustible material is in a partially compacted state when it is air dried in said drying step.

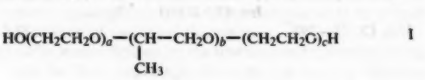
4,561,861

MOTOR FUEL COMPOSITION

Marshall E. Davis, Poughkeepsie, and Rodney L. Sung, Fishkill, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

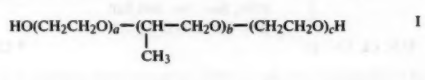
Filed Nov. 1, 1984, Ser. No. 667,048
Int. Cl.[4] C10L 1/32
U.S. Cl. 44—51 12 Claims

1. A clear stable motor fuel composition of the "water-in-petroleum" type microemulsion in which the average particle diameter of the dispersed phase is about 0.1 micron or smaller, said motor fuel composition comprising a mixture of alcohol selected from the group consisting of methanol in the amount of about 2.0 to 5.0 vol. %, ethanol in the amount of about 2.0 to 10.0 vol. %, and mixtures thereof in the amount of about 3 to 9.0 vol. %; about 2.0 to 10 vol. % of a cosolvent alcohol selected from the group consisting of tertiary butyl alcohol, isopropanol, and mixtures thereof; water to provide a total water concentration of about 0.1 to 0.5 wt. %; about 0.01 to 2.0 wt. % of a nonionic surfactant represented by Formula I, as follows:



where: a+c is an integer in the range of about 8.0–16.0, and b is an integer in the range of about 12–22; and the balance of said motor fuel composition comprising gasoline.

11. A method for operating an internal combustion engine which comprises supplying thereto and combusting therein a clear stable gasoline-alcohol-water motor fuel composition of the "water-in-petroleum" type microemulsion in which the average particle diameter of the dispersed phase is about 0.1 micron or smaller, said motor fuel composition having a Research Octane Number in the range of above 85 and up to about 102 and comprising a mixture of alcohol selected from the group consisting of methanol in the amount of about 2.0 to 5.0 vol. %, ethanol in the amount of about 2.0 to 10.0 vol. %, and mixtures thereof in the amount of about 3 to 9.0 vol. %; about 2.0 to 10 vol. % of a cosolvent alcohol selected from the group consisting of tertiary butyl alcohol, isopropanol, and mixtures thereof, wherein the volumetric ratio of tertiary butyl alcohol and/or isopropanol to methanol and/or ethanol is in the range of about 0.30 to 3.0; water to provide a total water concentration of about 0.1 to 0.5 wt. %; and about 0.10 to 3.0 wt. % of a nonionic surfactant having a molecular weight in the range of about 1200 to 1750 and which is represented by structural Formula I, as follows:



where: a+c is an integer in the range of about 8.0–16.0, and b is an integer in the range of about 12–22; and the remainder of said motor fuel composition comprising the base fuel gasoline.

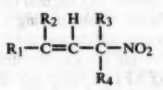
4,561,862

USE OF SELECTED BETA-NITROALKENES AS CETANE NUMBER BOOSTERS FOR DIESEL FUEL

Thomas S. Dory, New Haven, Conn., assignor to Olin Corporation, Cheshire, Conn.

Filed Apr. 8, 1985, Ser. No. 721,099
Int. Cl.[4] C10L 1/22
U.S. Cl. 44—57 10 Claims

1. A diesel fuel comprising a base fuel selected from the group consisting of liquid hydrocarbons of the diesel boiling range, alcohols, and mixtures thereof, and an effective cetane number-increasing amount of at least one beta-nitroalkene of the formula:



wherein R_1, R_2, R_3 and R_4 are individually selected from the group consisting of hydrogen and alkyl groups having from 1 to about 13 carbon atoms, with the proviso that the sum of R_1, R_2, R_3 and R_4 contains from 2 to about 13 carbon atoms.

4,561,863

GRINDING WHEEL AND MANUFACTURING METHOD THEREOF

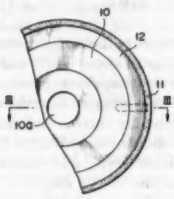
Masahiro Hashimoto, Kamakura, and Hideo Tani, Nara, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Osaka Kongo Seito Co., Osaka, both of, Japan

Filed Jun. 26, 1984, Ser. No. 624,771

Claims priority, application Japan, Jun. 27, 1983, 58-115445

Int. Cl.[4] B24D *11/00*

U.S. Cl. 51—295 **22 Claims**



1. A grinding wheel comprising a number of abrasive grains coated with a conductive material, a nonconductive bond for bonding the abrasive grains, and a diamond filler dispersed in the bond.

4,561,864

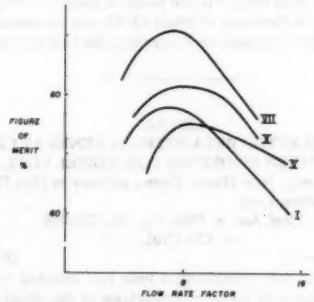
GAS SWEETENING BY MEMBRANE PERMEATION

Donald L. Klass, Barrington, and Carl D. Landahl, Chicago, both of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Continuation-in-part of Ser. No. 63,057, Aug. 2, 1979, abandoned, which is a continuation of Ser. No. 876,225, Feb. 9, 1978, abandoned, which is a continuation-in-part of Ser. No. 453,210, Mar. 21, 1974, abandoned. This application Oct. 12, 1984, Ser. No. 660,020

Int. Cl.[4] B01D *53/22*

U.S. Cl. 55—16 **7 Claims**



1. A method for sweetening a gas mixture which contains methane gas, hydrogen sulfide and carbon dioxide, comprising the steps of providing a gas mixture which contains methane gas and hydrogen sulfide and carbon dioxide, providing non-homogenous membrane means having a combined separation factor for the hydrogen sulfide and the carbon dioxide greater than about 20, delivering the gas mixture to said membrane at a flow rate factor (FRF) on the order of about 8, wherein

$$FRF = V/(A)(PD)(PR)$$

wherein V is the rate of delivery of the gas mixture to said membrane, A is the area of said membrane, PD is the pressure difference across said membrane and PR is the permeation rate of said membrane for methane, whereby the merit factor of said membrane is maximized.

4,561,865

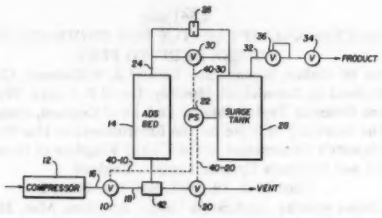
SINGLE BED PRESSURE SWING ADSORPTION GAS SEPARATION SYSTEM

Norman R. McCombs, Tonawanda, and Ravinder K. Bansal, East Amherst, both of N.Y., assignors to Greene & Kellogg, Inc., Tonawanda, N.Y.

Filed Nov. 1, 1983, Ser. No. 547,494

Int. Cl.[4] B01D *53/04*

U.S. Cl. 55—25 **14 Claims**



1. A PSA system having a single bed, said system including a PSA cycle, means to cause said cycle to operate said single bed between highest pressure, lowest pressure, and intermediate pressure, said system including tank means for receiving the output of product gas from said single bed, said system comprising control means, said control means causing said cycle to perform a production step wherein the pressure in said bed and said tank means are increased from said intermediate pressure to said highest pressure, said control means causing said cycle to perform a purge step wherein the pressure in said bed is decreased from said highest pressure to said lowest pressure, conduit means containing valve means interconnecting said single bed and said valve means, and said control means causing said last mentioned valve means and said cycle to perform a pressure equalization step wherein the pressures in said bed and said tank means are equalized at said intermediate pressure.

11. A pressure swing process for fractioning at least one component gas from a mixture of gasses by selective adsorption in only a single adsorption zone and utilizing tank means to receive the output of said at least one component gas from said single adsorption zone, comprising the steps of operating said single adsorption zone between highest pressure, lowest pressure and intermediate pressure, the process including a production step wherein the pressures in said zone and in said tank means are increased from said intermediate pressure to said highest pressure, a purge step wherein the pressure in said zone is decreased from said highest pressure to said lowest pressure, and a pressure equalization step wherein the pressures in said zone and in said tank means are equalized at said intermediate pressure.

4,561,866

APPARATUS FOR VACUUM CLEANING OF OIL FILLINGS

Josef Altmann, Domazlice, Jaromir Ratislav, and Jaromir Ratislav, both of Pilsen, all of Czechoslovakia, assignors to Skoda, koncernova podnik, Pilsen, Czechoslovakia

Continuation-in-part of Ser. No. 547,421, Oct. 31, 1983, abandoned. This application Oct. 19, 1984, Ser. No. 662,849

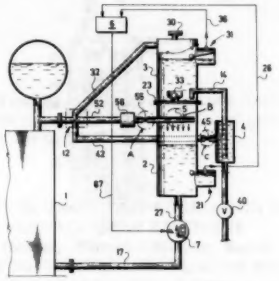
Claims priority, application Czechoslovakia, Nov. 3, 1982, 7801-82

Int. Cl.[4] B01D *19/00*

U.S. Cl. 55—166 **6 Claims**

1. An apparatus for the vacuum cleaning of oil fillings comprising a vacuum separator alternately operating in a separat-

ing cycle and a compression cycle, a reversible pump, a piping system connecting the reversible pump to the vacuum separator by which, in the separating cycle, clean oil is sucked off from the separator, and in the compression cycle, contaminated oil is delivered into said vacuum separator, means for producing a vacuum in the separator in the separating cycle by the downward oil level movement therein, means for producing a slight super-atmospheric pressure in the vacuum separator in the compression cycle by the upward oil level movement



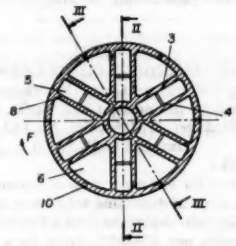
therein, an accumulation extension vessel, further piping connecting the pump to the accumulation extension vessel for receiving the separated contaminants ejected by the pump from the separator, a discharge conduit connected to the accumulation extension vessel, a gravity separator connected to the discharge conduit to receive oil and water from separation from each other, and control means including a flip-flop circuit for controlling the operation of the reversible pump and consequently the operation of the entire apparatus during its separating cycle and its compression cycle.

4,561,867

APPARATUS FOR SEPARATING A LIQUID FROM A GAS, PARTICULARLY FOR TURBOENGINE BEARING CASES

Jean-Louis Charbonnel, Le Mee sur Seine, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.", Paris, France

Filed Dec. 10, 1984, Ser. No. 679,903
Claims priority, application France, Dec. 14, 1983, 83 19986
Int. Cl.⁴ B01D *19/00*
U.S. Cl. 55—202 **21 Claims**



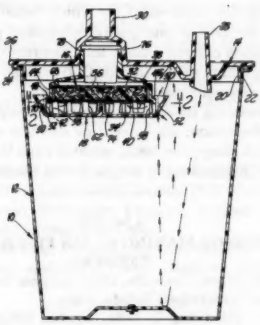
1. Apparatus for separating liquid from a gas comprising:
(a) a first hollow pipe;
(b) a second pipe concentrically arranged with respect to the first pipe, the second pipe defining an inlet for a gas-liquid mixture;
(c) a plurality of partition means extending generally parallel to the longitudinal axis of the first and second pipes and interconnecting the first and second pipes, the partition means defining a plurality of first channels communicating with the inlet;
(d) a plurality of second channels defined by the second pipe and adjacent partition means;
(e) a plurality of first orifices defined by the partition means to allow liquid to pass from a first channel into an adjacent second channel;
(f) a plurality of second orifices defined by the second pipe communicating with the second channels so as to permit evacuation of the liquid therefrom;
(g) outlet means defined by the first pipe and communicating with the first channels to allow the gas to be withdrawn therefrom; and,
(h) means to rotate the first and second pipes.

4,561,868

CANISTER FILTER ASSEMBLY

Charles von Reis, 1923 Dunmore Rd., Ann Arbor, Mich. 48103, and Karlis Vizulis, 202½ W. Henry, Saline, Mich. 48176

Filed Jul. 2, 1984, Ser. No. 627,186
Int. Cl.⁴ B01D *46/10*
U.S. Cl. 55—319 **27 Claims**



1. A canister filter assembly (**10**) for use in a vacuum line for trapping particulates and liquids from fluid drawn through the vacuum line, said assembly (**10**) comprising: a container portion (**12**); a lid portion (**14**) disposed over said container portion (**12**) in sealing engagement therewith, said lid portion (**14**) including a fluid inlet (**28**) and a fluid outlet (**30**); filter means (**16**) for filtering the particulates and liquids from the fluids passing through said fluid outlet (**30**); and filter support means (**18**) for supporting said filter means (**16**) within said fluid outlet (**30**) and characterized by including cover means (**40**) spaced below said filter means (**16**) for forcing the flow of fluid into said filter support means (**18**) downwardly away from said filter means (**16**) prior to flowing in the opposite direction through said filter means (**16**).

4,561,869

CRYOGENIC PROCESS FOR THE SELECTIVE REMOVAL OF ACID GASES FROM GAS MIXTURES BY MEANS OF A SOLVENT

Luigi Gazzi; Roberto D'Ambra, both of Milan; Roberto Di Cintio; Carlo Rescalli, both of S.Donato Milanese, and Alessandro Vetere, Milan, all of Italy, assignors to Snamprogetti, S.p.A., Milan, Italy

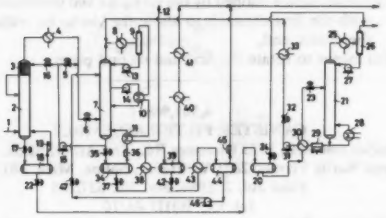
Filed Dec. 27, 1983, Ser. No. 565,454
Claims priority, application Italy, Jan. 19, 1983, 19176 A/83
Int. Cl.⁴ F25J *3/02*
U.S. Cl. 62—17 **51 Claims**

1. A cryogenic process for the fractional removal of acid gases from natural or synthesis gases containing H_2S and CO_2, comprising recovering a product which is essentially acid gas free from a feed material having a very high acid gas content

of about 50 mole % or more of acid gases by the following steps:

(a) selectively removing H_2S from the natural or synthesis gas in a first absorption column with at least one regeneratable solvent having a high selectivity for H_2S;

(b) cooling the substantially H_2S-free gas sufficiently to condense part of the CO_2 contained in said gas so that the acid gases which remain uncondensed do not exceed 30 mole % in the gaseous phase;



(c) selectivity removing CO_2 which remains uncondensed from the cooled and partly condensed gas in a second absorption column with at least one regeneratable solvent having a high selectivity for CO_2 in order to produce said essentially acid gas free product; and

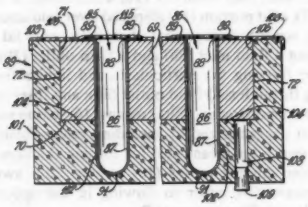
(d) regenerating the solvent or solvents used in the CO_2 and H_2S absorption; the solvent or solvents used in the CO_2 and H_2S absorption being selected from the group consisting of low molecular weight esters, alcohols and ethers.

4,561,870

METHOD OF MAKING GLASS FIBER FORMING FEEDERS

Mohinder S. Bhatti, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Aug. 9, 1984, Ser. No. 639,170
Int. Cl.⁴ C03B *37/08*
U.S. Cl. 65—1 **10 Claims**



1. A method of making an orificed discharge wall of a feeder for producing glass filaments from a plurality of streams of molten glass issuing therefrom comprising:

inserting elements in apertures in a member;

adhesively securing an elastic membrane to a surface of said member and said elements positioned therein, said membrane being adapted to isostatically transmit pressure to said elements and member;

applying cold isostatic pressure to the elements and member having said membrane secured thereto to mechanically seal the elements to the member; and

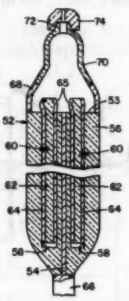
fusing the mechanically sealed elements and member together to prevent the unwanted passage of molten glass between said elements and said member, said elements having an orifice to permit the passage of molten glass therethrough to establish said streams.

4,561,871

METHOD OF MAKING POLARIZATION PRESERVING OPTICAL FIBER

George E. Berkey, Pine City, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Dec. 27, 1983, Ser. No. 565,637
Int. Cl.⁴ C03B *37/023*
U.S. Cl. 65—3.11 **7 Claims**



3. A method of forming a polarization preserving optical fiber comprising the steps of

providing a cylindrical preform comprising a centrally disposed glass core surrounded by a layer of cladding glass having a first composition, said preform cladding glass having a refractive index lower than that of the core glass,

forming in said cladding glass on diametrically opposed sides of said preform core a pair of longitudinally-extending holes, the axes of which are parallel to that of said core,

providing a pair of glass rods having a thermal coefficient of expansion which differs from that of said preform cladding glass, the cross-sectional area of said rods being slightly smaller than that of said holes except at one end thereof where the rod cross-sectional area is greater than that of said holes,

inserting one of said rods into each of said holes prior to drawing, the large diameter ends of said rods protruding above said preform, wherein said rods are prevented from melting and sliding downwardly in said holes,

affixing a vacuum connection to that end of said preform from which the large diameter ends of said rods protrude, whereby the space between each rod and the adjacent walls of said holes is evacuated, and

drawing the resulting assembly to bond together said glass rods and said preform into an integral optical fiber.

4,561,872

METHOD FOR MAKING GLASS OR CERAMIC ARTICLE

John C. Luong, Corning, and George W. Scherer, Big Flats, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Oct. 22, 1984, Ser. No. 663,161
Int. Cl.⁴ C03B *19/06*
U.S. Cl. 65—18.1 **4 Claims**

1. In a method for making a glass or ceramic article which comprises the steps of dispersing submicron-sized oxide particles in a non-aqueous vehicle to form a fluid suspension, forming the suspension into a configuration for a preform for the article and causing it to gel in that configuration, drying the gelled preform, and sintering the gelled preform to produce a unitary glass or ceramic article, the improvement wherein:

prior to dispersion of said oxide particles in the non-aqueous vehicle, the oxide particles are treated with an alcohol to render them hydrophobic, wherein the treatment of the oxide particles comprises contacting the oxide particles with an alcohol at a temperature sufficient to react the alcohol with hydroxl groups present on the surfaces of the

particles, the alcohol being of the formula ROH wherein R is a substituted or unsubstituted hydrocarbon group of

from 3–18 carbon atoms and the reaction resulting in the substitution of —OR groups for hydroxyl groups on the surfaces of the particles.

4,561,873

MODIFICATION OF DEPOSIT FORMATION IN GLASS FURNACE HEAT RECOVERY

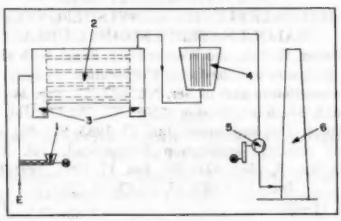
Hans-Ulrich Hempel, Overath-Vilkerath; Rudolf Novotny, Duesseldorf; Siegfried Staller, Ratingen, and Johannes Krä mer, Duesseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 676,958, Nov. 30, 1984, abandoned. This application Dec. 3, 1984, Ser. No. 677,253

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1983, 3343639

Int. Cl.⁴ C03B *5/16*

U.S. Cl. 65—27 **20 Claims**



1. A method of facilitating the removal of desublimated evaporated solids deposited in heat exchange tubes of a boiler for waste heat recovery from glass furnace waste gases comprising:

introducing natural and/or synthetic sodium aluminum silicates having an average particle size of about 0.5 to 50 μm via a metering means into said waste gases while they are at a temperature of about 450° to 700° C. and before said waste gases enter said boiler, in an amount adequate to prevent the formation of firmly adhering solid encrustations in said heat exchange tubes.

4,561,874

METHOD FOR HEAT SEALING A GUN MOUNT IN A CRT NECK

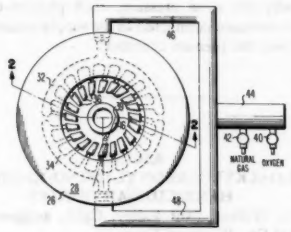
Michael A. Colacello, Trenton; Emil V. Fitzke, West Windsor Township, Mercer County, and Jack F. Otto, Ewing Township, Mercer County, all of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Sep. 10, 1984, Ser. No. 648,809

Int. Cl.⁴ C03B *23/217*

U.S. Cl. 65—36 **2 Claims**

1. Method for heating a non-rotating neck of a cathode-ray tube having a circular cross-section and for sealing a wafer therein, said method comprising substantially uniformly heating completely around said neck approximately in the plane of said wafer by providing a rotating flow of hot gases around said neck from a plurality of burner tips similarly aimed non-radially with respect to said circular cross-section along directions tangent to points substantially halfway between the outside diameters of said neck and said wafer, said providing step comprising the steps of:



firstly, providing said hot gases slightly above the plane of said wafer to cause a reduction in diameter of said neck;

secondly, providing said hot gases slightly below the plane of said wafer to cut off excess material from said neck; and

thirdly, thereafter providing said hot gases in the plane of said wafer to seal said neck and said wafer together.

4,561,875

MOULD ARRANGEMENT FOR A CYCLICLY OPERATING GLASSWARE FORMING MACHINE

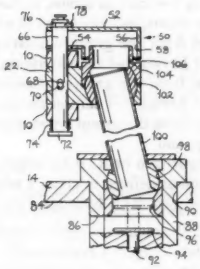
Thomas V. Foster, Doncaster, England, assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Dec. 17, 1984, Ser. No. 682,210

Claims priority, application United Kingdom, Dec. 20, 1983, 8333900

Int. Cl.⁴ C03B *9/38*

U.S. Cl. 65—267 **12 Claims**



1. A mould arrangement for use in a cyclicly operating glassware forming machine, the arrangement comprising two supports on each of which one of two opposed side portions of a mould is mounted, each side portion defining side portions of a cavity of the mould which has an upwardly-facing opening through which molten glass can be introduced into the cavity to be moulded to the shape of the cavity, the supports being movable in a cycle of operation of the machine to a first position thereof, in which the side portions engage one another to co-operate in defining the mould cavity so that moulding can take place, and to a second position thereof, in which the side portions are separated from one another so that the moulded glass can be removed from the mould, the side portions also defining cooling passages each extending downwardly from an entrance in an upper surface of the side portion so that air can pass through the passages to cool the side portion, wherein the

mould arrangement also comprises two plenum chambers each of which is associated with a separate one of the supports and is mounted for movement therewith, each plenum chamber extending above the upper surface of the side portion mounted on its associated support without obstructing the opening of the cavity, each plenum chamber having one or more exits which open downwardly and communicate with the entrances of the cooling passages in said side portion so that air supplied to the plenum chamber is supplied to each cooling passage at substantially the same pressure, each plenum chamber also having an entrance connected to air supply means operable to blow air into the plenum chamber.

4,561,876

HALOALKYLCARBONYLAMINO-1,3-DIOXANE HERBICIDE ANTIDOTES

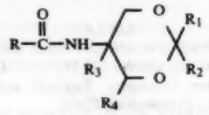
Francis H. Walker, Mill Valley, Calif., assignor to Stauffer Chemical Co., Westport, Conn.

Continuation-in-part of Ser. No. 144,703, Apr. 28, 1980, which is a division of Ser. No. 23,222, Mar. 23, 1979, abandoned. This application Jun. 16, 1981, Ser. No. 271,899

Int. Cl.⁴ A01N *43/00;* **C07D** *319/06*

U.S. Cl. 71—88 **41 Claims**

1. A compound having the formula



in which

R is haloalkyl wherein halo is chlorine, bromine or iodine and the alkyl group has 1–4 carbon atoms, inclusive;

R_1 is selected from the group consisting of hydrogen; lower alkyl having 1–4 carbon atoms, inclusive; alkenyl having 2–4 carbon atoms, inclusive; and phenyl;

R_2 is selected from the group consisting of hydrogen and lower alkyl having 1–4 carbon atoms, inclusive;

R_3 is selected from the group consisting of hydrogen and lower alkyl having 1–4 carbon atoms, inclusive;

R_4 is selected from the group consisting of hydrogen and a nitro group; and

either R_3 is hydrogen or R_4 is hydrogen.

2. A compound as defined in claim **1** wherein R is dibromoethyl, R_1 is hydrogen, R_2 is hydrogen, R_3 is methyl and R_4 is hydrogen.

4,561,877

DERIVATIVES OF TETRAHYDROBENZOTHIAZOLE AND HERBICIDAL COMPOSITIONS CONTAINING THE SAME AS ACTIVE INGREDIENT

Katsumichi Aoki; Takafumi Shida; Hideo Arabori; Satoru Kumazawa; Susumu Shimizu; Takeo Watanabe; Yohichi Kanda; Keigo Satake; Shiro Yamazaki; Hiroyasu Shinkawa, and Tsuneaki Chida, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

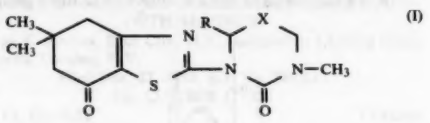
Filed Apr. 5, 1984, Ser. No. 596,927

Claims priority, application Japan, Apr. 8, 1983, 58-61925

Int. Cl.⁴ A01N *43/54, 43/66, 43/78;* **C07D** *417/04*

U.S. Cl. 71—90 **10 Claims**

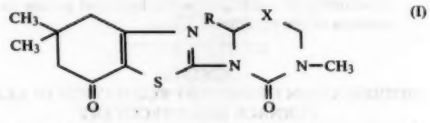
1. A derivative of tetrahydrobenzothiazole, represented by the formula (I):



(I)

wherein R represents a hydrogen atom, a hydroxyl group or a lower-acyloxy group selected from acetoxy group and propionyloxy group and X represents a methylene group, a C_1 to C_4-alkylamino group, a benzylamino group or —O—.

6. A herbicidal composition comprising as an active ingredient a herbicidally effective amount of at least one derivative of tetrahydrobenzothiazole, represented by the formula (I):



(I)

wherein R represents a hydrogen atom, a hydroxyl-, acetoxy- or propionyloxy group and X represents a methylene-, C_1 to C_4-alkylamino- or benzylamino group or —O—, and a diluent therefor.

4,561,878

N-(2-HALOALKOXY- AND 2-HALOALKYLTHIOPHENYLSULFONYL)-N'-(HALOGENATEDPYRIDINYL)UREAS

Willy Meyer, Riehen, and Werner Föry, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

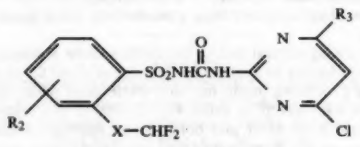
Continuation-in-part of Ser. No. 423,352, Sep. 24, 1982, abandoned, which is a division of Ser. No. 282,779, Jul. 13, 1981, abandoned. This application Jan. 17, 1983, Ser. No. 458,693

Claims priority, application Switzerland, Jul. 17, 1980, 5481/80; Nov. 5, 1980, 8216/80; Jun. 17, 1981, 3991/81

Int. Cl.⁴ E05B *65/10;* **C07D** *239/02*

U.S. Cl. 71—92 **11 Claims**

1. A compound selected from the group consisting of a sulfonylurea of the formula:



wherein

X is oxygen or sulfur;

R_2 is hydrogen, chloro or fluoro; and

R_3 is chloro, fluoro, methyl, ethyl, methoxy, ethoxy, isopropoxy or chloromethyl; and

the alkali metal, alkaline earth metal, organic amine and quaternary salts thereof.

8. A method of controlling undesired plant growth, which method comprises applying thereto or to the locus thereof a herbicidally effective amount of a compound according to claim **1**.

9. A method of suppressing plant growth, which method comprises applying thereto or to the locus thereof an effective amount of a compound according to claim **1**.

4,561,879

COMPOSITION AND METHOD FOR COMBATING WEEDS USING AN N-IMIDAZOLYLMETHYL HALOGENOACETANILIDE

Rudolf Thomas; Wilfried Draber, both of Wuppertal; Robert R. Schmidt, Cologne, and Ludwig Eue, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

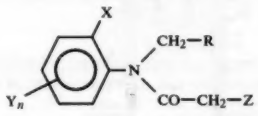
Continuation of Ser. No. 110,721, Jan. 9, 1980, abandoned, which is a division of Ser. No. 869,068, Jan. 12, 1978, Pat. No. 4,517,011. This application Sep. 19, 1984, Ser. No. 652,413

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1977, 2704281; Sep. 22, 1977, 2742583

Int. Cl.[4] A01N *43/50*

U.S. Cl. 71—92 **9 Claims**

2. A method of combating weeds which comprises applying to the weeds or to their habitat a herbicidally effective amount of an N-substituted halogenoacetanilide of the formula



(I)

in which

R represent imidazol-1-yl or substituted imidazol-1-yl wherein the substituent is at least one of halogen and alkyl of 1 to 4 carbon atoms,

X and Y which may be identical or different, each represents alkyl of 1 to 4 carbon atoms,

Z represents chlorine or bromine and

n represents 0, 1 or 2

or an acid addition salt thereof, alone or in the form of a composition containing the same in a herbicidally effective amount in admixture with a diluent or carrier.

4,561,880

1H[1,2,4]-TRIAZOLO[1,2-A]PYRIDAZINE-1,3-DIONES USEFUL AS HERBICIDES

Shizuo Shimano, Ageo; Shinichi Kobayashi, Fuchu; Mikio Yanagi, Okegawa; Osamu Yamada, Ageo; Atsuhiko Shida, Koga, and Fumio Futatsuya, Ohmiya, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

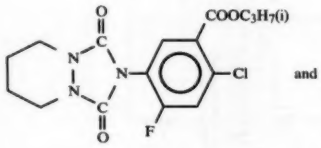
Filed Aug. 16, 1983, Ser. No. 523,585

Claims priority, application Japan, Sep. 2, 1982, 57-151696; Sep. 13, 1982, 57-158227

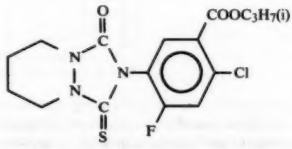
Int. Cl.[4] A01N *43/56, 43/58, 43/62;* **C07D** *487/04, 231/04, 237/04, 243/02*

U.S. Cl. 71—92 **3 Claims**

1. A compound selected from the group consisting of



and



wherein

R^5 is C_1–C_{12} alkyl and may further be substituted with one or more halogens, or aryl selected from the group consisting of 6-membered rings containing 0–3 nitrogens and fused bicyclic 10-membered rings containing 6 atoms in each ring and 0–3 nitrogens per ring with the remaining atoms in the ring or rings of said aryl group being carbon atoms, said aryl group being optionally substituted with C_1–C_4 alkyl or an electron-withdrawing group selected from the group consisting of nitro, carboxy, COR^6, CHO, $COOR^6$, halogen, $CONR^6R^7$ and cyano; and

R^3 is hydrogen, halogen, C_1–C_4 alkyl, carboxy or an agronomically acceptable alkali metal salt thereof, or a group of the formula —$COOR^6$ or —$CONR^6R^7$, wherein R^6 is C_1–C_4 alkyl, and R^7 is R^6 or hydrogen.

20. A plant-growth-regulating composition comprising at least one compound of claim 1 in combination with an agronomically acceptable carrier.

22. A method of producing hybrid seeds from a self-pollinizing plant which comprises sterilizing the male anthers of a female parent plant with a compound of claim 1 and pollenating said female parent with pollen from an untreated male parent, thereby producing said hybrid seed.

4,561,881

POLLEN SUPPRESSANT COMPRISING A PYRIDAZOLYLAMINE

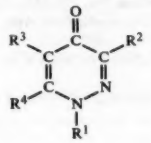
Jeffrey N. Labovitz, Palo Alto, and Lawrence Fang, Daly City, both of Calif., assignors to Lafarge Coppee, Paris, France

Filed Sep. 14, 1983, Ser. No. 532,094

Int. Cl.[4] A01N *43/58;* **C07D** *237/34, 403/04, 401/12*

U.S. Cl. 71—92 **37 Claims**

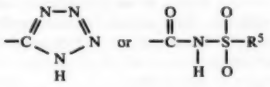
1. A pollen suppressant of the formula



wherein

R^1 and R^4 independently represent C_1–C_4 alkyl, phenyl, naphthyl, or phenyl or naphthyl substituted with one to three substituents selected from the group consisting of halogen, trihalomethyl, C_1–C_4 alkoxy, C_1–C_4 alkyl, and cyano;

R^2 is



wherein

4,561,882
3-ALKOXY-4-SUBSTITUTED-PHENOXY-2,3-UNSATURATED ACID ESTERS AND DERIVATIVES THEREOF AND THE USE THEREOF FOR THE CONTROL OF WEEDS

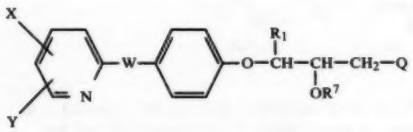
Shy-Fuh Lee, Sunnyvale, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 388,333, Jun. 14, 1982, abandoned, and a continuation-in-part of Ser. No. 379,609, May 19, 1982, Pat. No. 4,529,438, which is a continuation-in-part of Ser. No. 361,161, Mar. 23, 1982, Pat. No. 4,525,205, which is a continuation-in-part of Ser. No. 341,736, Jan. 22, 1982, Pat. No. 4,429,167, which is a continuation-in-part of Ser. No. 299,413, Sep. 4, 1981, Pat. No. 4,408,076, which is a continuation-in-part of Ser. No. 270,938, Jun. 5, 1981, abandoned, which is a continuation-in-part of Ser. No. 196,795, Oct. 14, 1980, abandoned, said Ser. No. 388,333, is a division of Ser. No. 314,639, Oct. 26, 1981, abandoned, which is a continuation-in-part of Ser. No. 299,413, , Ser. No. 270,938, , and Ser. No. 196,795,. This application Apr. 20, 1983, Ser. No. 486,750

Int. Cl.[4] A01N *43/40*; C07D *213/64*

U.S. Cl. 71—94 30 Claims

1. A compound selected from those of the formula B':



(B')

wherein

W is O, or S;

each of X and Y is independently selected from hydrogen, bromo, chloro, fluoro, lower alkyl, lower alkoxy, lower alkoxycarbonyl, nitro, cyano, trifluoromethyl, chlorodifluoromethyl, fluoromethyl, chloromethyl and difluoromethoxy;

R^1 is hydrogen or lower alkyl;

Q is selected from $COOR^3$, $COSR^3$, or $CONR^4R^5$ in which R^3 is hydrogen, lower alkyl, lower haloalkyl, lower cyanoalkyl, lower alkenyl, lower haloalkenyl, lower alkynyl, lower alkoxyalkyl, lower dialkylaminoalkyl, lower alkylthioalkyl, lower alkylsulfinylalkyl, lower alkylsulfonylalkyl, tetrahydrofuranylmethyl, tetrahydropyranylmethyl, pyridylmethyl, benzyl, halobenzyl, lower alkylbenzyl, lower alkoxybenzyl, phenyl, halophenyl, lower alkoxyphenyl, lower alkylphenyl, cycloalkyl, cycloalkalkyl, N-alkylideneamino, sodium, potassium, magnesium, or calcium;

each of R^4 and R^5 is independently selected from hydrogen, lower alkyl, lower hydroxyalkyl, lower alkoxyalkyl, or lower alkylsulfonyl; and R^7 is selected from carboxylic acyl, phenylacyl, phenoxyacyl, (X,Y-substituted)phenoxyacyl, (X-substituted)phenylacyl, (X,Y-substituted phenoxy)phenylacyl, and (X,Y-substituted phenoxy)-(X-substituted phenyl)acyl.

11. A herbicidal composition which comprises a herbicidally effective amount of a compound of claim 1 and a suitable carrier material.

21. A method for the control of weeds which comprises applying to the locus of said weeds a herbicidally effective amount of a compound of claim 1.

4,561,883
METHOD OF PRODUCING METALS OR METAL ALLOYS AND AN ARRANGEMENT THEREFOR

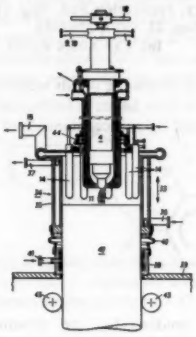
Paul Müllner, Traun; Bernhard Enkner, Linz, and Gerhard Hubweber, Frankenmarkt, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Aug. 7, 1984, Ser. No. 638,640

Claims priority, application Austria, Aug. 18, 1983, 2954/83

Int. Cl.[4] C22B *4/00*

U.S. Cl. 75—10 R 15 Claims



1. A method of producing a metal comprising the steps of:

creating a plasma jet reaction zone by establishing a plasma jet in a plasma gas including hydrogen and a vaporized halide of said metal wherein said metal halide is reduced and molten metal formed, and

collecting the molten metal resulting from the reduction of the vaporized metal halide in said plasma jet reaction zone.

4,561,884
APPARATUS FOR REMOVAL OF IMPURITY COMPONENTS FROM SULPHIDIC AND METALLIZED MOLTEN COPPER MATTES

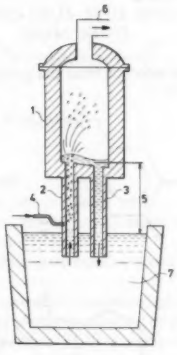
Simo A. I. Mäkipirtti, and Pekka T. Setälä, both of Nakkila, Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed Sep. 25, 1981, Ser. No. 305,509

Claims priority, application Finland, Sep. 26, 1980, 803053

Int. Cl.[4] C22B *1/02*

U.S. Cl. 75—21 4 Claims



1. A process for the removal of impurity components from sulphidic and metallized molten copper mattes, in which in preliminary smelting of crude metal molten sulphide and mol-

ten arsenide-antimonide phases are produced, comprising: (a) treating the molten arsenide-antimonide matte with elemental sulphur vapor to produce molten sulphide and molten arsenide phases in equilibrium with each other, then sulphurating a conjugate melt system continuously under reduced pressure in order to volatilize arsenic, antimony, bismuth, lead and tin; or (b) separating from each other the conjugate molten phases in equilibrium with each other, sulphurating a separated arsenide matte further in a solid state and advantageously using elemental sulphur vapor at high partial pressure in order to volatilize arsenic, antimony, bismuth, selenium and tellurium from the matte as sulphides, and sulphurating separated molten sulphide phase under reduced pressure to volatilize arsenic, antimony, bismuth, lead and tin from the melt; in which process the arsenide-antimonide melt, the temperature of which is 1100°–1300° C., is treated with a gas which has a temperature of 500°–600° C. and in which the partial pressure of sulphur vapor is at least 0.1 atm in order to concentrate copper, lead and tin in a sulphide phase and to concentrate nickel, arsenic and antimony in an arsenide phase.

4,561,885

PRODUCTION OF REFRACTORY MATERIALS

Norris B. McFarlane, P.O. Box 130, Charleston, S.C. 29402

Filed Jan. 25, 1985, Ser. No. 695,163
Int. Cl.⁴ C22B *7/00*
U.S. Cl. 75—30 **12 Claims**

1. In a high-carbon ferrochromium smelting process in which chromitite is smelted in a smelting furnace, a mixture of molten ferrochromium metal and slag from the smelting furnace is received in a first vessel, and molten slag is removed from molten metal in the first vessel and received into a second vessel, the improvement therein comprising the steps of:

(a) retaining the molten slag in the second vessel for a sufficient time to form a non-flowable solidified lining of slag on the inside wall surfaces of the second vessel,

(b) removing flowable molten slag from the central portion of the second vessel while retaining the lining of solidified slag on the inside wall surfaces thereof, and

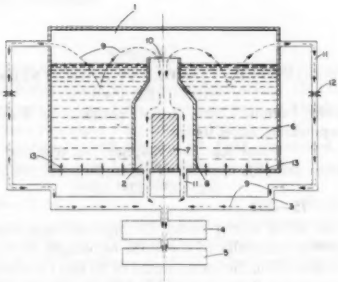
(c) thereafter employing the second vessel containing the solidified slag lining as a refractory to receive high temperature material in a high temperature processing operation.

4,561,886

METHOD OF HEATING, MELTING AND COAL CONVERSION AND APPARATUS FOR THE SAME

Ernest S. Geskin, 21 Karen Pl., Edison, N.J. 08817

Division of Ser. No. 196,265, Oct. 14, 1980, Pat. No. 4,422,872. This application May 2, 1983, Ser. No. 476,012
Int. Cl.⁴ C21C *7/00*
U.S. Cl. 75—51.2 **1 Claim**



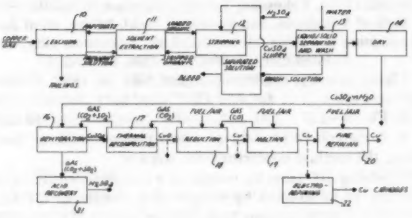
1. A method of continously generating steam comprising injecting air and coal into molten metal contained in a first vessel, transferring the melt thus injected with said coal and air into a second vessel, injecting water into the melt contained in the second vessel thereby generaling steam of sufficient quality to operate a turbene and transferring the melt from the second vessel back to the first vessel.

4,561,887

PROCESS FOR RECOVERING METALS FROM SOLUTION THROUGH SOLVENT EXTRACTION AND PYROMETALLURGICAL REDUCTION

Esteban M. Domic, and Hans C. Hein, both of Santiago, Chile, assignors to Sociedad Minera Pudahuel Ltda., C.P.A., Santiago, Chile

Continuation-in-part of Ser. No. 400,875, Jul. 22, 1982, abandoned. This application Jul. 26, 1984, Ser. No. 634,770
Int. Cl.⁴ C22B *15/00*
U.S. Cl. 75—65 R **23 Claims**



1. A metal recovery process comprising the steps of:

contacting an aqueous solution containing metal ion selected from the group consisting of copper, zinc, iron, nickel, cobalt, gold, silver, cadmium, lead, tin, manganese and mercury with an immiscible organic liquid for selectively extracting such metal ion from the aqueous solution and replacing such metal ion with hydrogen ion from the organic liquid;

contacting the organic liquid with a strongly acidic aqueous solution containing a sufficient concentration of such metal ion for precipitating sufficiently small crystals of a salt of such metal that such crystals at least temporarily remain suspended in such a liquid phase and replenishing hydrogen ion in the organic liquid;

separating the precipitated metal salt crystals from such liquid phase;

recycling the organic liquid for contacting additional aqueous solution;

dehydrating the metal salt;

pyrometallurgically reducing the metal salt with a carbonaceous fuel and producing gaseous products; and

recovering the anion portion of the metal salt from the gaseous products.

4,561,888

WELDING WIRE FOR USE IN SUBMERGED ARC WELDING OF CR-MO STEELS

Naoki Okuda; Minoru Yamada, and Fumito Yoshino, all of Kanagawa, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Oct. 25, 1983, Ser. No. 545,240
Claims priority, application Japan, Nov. 2, 1982, 57-192695
Int. Cl.⁴ C22C *38/44*
U.S. Cl. 75—124 **13 Claims**

1. A welding wire for use in submerged arc welding of Cr-Mo steels comprising, in weight percent, less than 0.25% C, less than 0.60% Si, 0.15–1.50% Mn, 0.50–10.0% Cr, 0.40–2.50% Mo and the balance Fe,

Wherein the welding wire consists essentially of, in weight percent, 0.05–0.19% C, less than 0.60% Si, less than 1.6% Mn, 1.43–10.5% Cr and 0.30–2.50% Mo as the basic elements,

Boron and nitrogen being incorporated to said wire as essential elements each in the range of 0.0001–0.025% B and 0.010–0.040% N; and at least one of titanium, zirconium and aluminum further incorporated therein each in the range of 0.01–0.30% Ti, 0.05–0.30% Zr and less than 0.40% Al, while being adjusted such that the sum of the elements Ti+Al+Zr+10B lies within a range between 0.003–0.40% and, the balance Fe.

4,561,889

WEAR-RESISTANT SINTERED FERROUS ALLOY AND METHOD OF PRODUCING SAME

Takaaki Oaku, Yokosuka; Yasuzi Hokazono; Masahiko Shiota, both of Yokohama, and Yoshihiro Maki, Miura, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama City, Japan

Filed Oct. 25, 1983, Ser. No. 545,245

Claims priority, application Japan, Nov. 26, 1982, 57-205951

Int. Cl.[4] C22C *38/16*

U.S. Cl. 75—125 **10 Claims**

1. A method of producing a wear-resistant sintered ferrous alloy, the method comprising the steps of:

preparing 100 parts by weight of a powder mixture by mixing 15 to 50 parts by weight of a powder of a Fe-Cr-B alloy which contains 10 to 35% by weight of Cr and 1.0 to 2.5% by weight of B, 1.0 to 3.5 parts by weight of a graphite powder, such an amount of a Cu-P alloy powder that the prepared powder mixture contains 0.2 to 1.5% by weight of P and 1.0 to 20.0% by weight of Cu and the balance of an iron powder;

compacting said powder mixture into a body of a desired shape; and

sintering said body in a nonoxidizing atmosphere.

8. A wear-resistant sintered ferrous alloy consisting essentially of 1.5 to 17.5% of Cr, 0.15 to 1.25% of B, 1.0 to 3.5% of C, 0.2 to 1.5% of P, 1.0 to 20.0% of Cu, by weight, and the balance of Fe.

4,561,890

TWO-PHASE STAINLESS CAST STEEL HAVING HIGH CORROSION FATIGUE STRENGTH

Hisashi Hiraishi, Kyoto; Hisakatsu Nishihara, Hirakata, and Hiroyuki Shiokawa, Osaka, all of Japan, assignors to Kubota Ltd., Osaka, Japan

Continuation of Ser. No. 465,520, Feb. 10, 1983, abandoned. This application Aug. 16, 1984, Ser. No. 641,408

Claims priority, application Japan, Feb. 23, 1982, 57-27665

Int. Cl.[4] C22C *38/52*

U.S. Cl. 75—125 **3 Claims**

1. A two-phase ferrite-austenite stainless cast steel having high corrosion fatigue strength consisting essentially of the following components in the following proportions in terms of % by weight:

$0 < C \leqq 0.1$,
$0 < Si \leqq 2.0$,
$0 < Mn \leqq 2.0$,
Cr: 22.0–27.0,
Ni: 5.0–9.0,
Mo: 1.1–2.5,
Cu: 0.5–2.5,
CO: 0.5–2.0 and
V: 0.5–2.0,

the balance being substantially Fe and unavoidable impurities.

4,561,891

POWDERY SILICON CARBIDE COMPOSITION FOR SINTERING

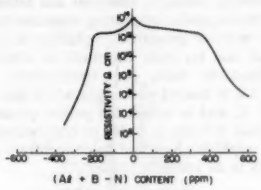
Kunihiro Maeda; Katsuhisa Usami; Yukio Takeda; Satoru Ogihara, and Osamu Asai, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 5, 1983, Ser. No. 538,816

Claims priority, application Japan, Oct. 6, 1982, 57-176851

Int. Cl.[4] C04B *35/56*; C22C *29/00*

U.S. Cl. 75—238 **4 Claims**



1. A powdery silicon carbide composition for producing a sintered silicon carbide body which comprises at least 90% by weight of silicon carbide powders having an average particle size of not more than 10 μm, powders of beryllium or a compound thereof in an amount of 0.01 to 4% by weight in terms of beryllium, and aluminum, boron, and nitrogen; the powders of beryllium and a compound thereof having an average particle size of not more than 30 μm, the content of nitrogen in the composition being not more than 500 ppm and the difference between the total content of aluminum and boron and the content of the nitrogen in the powdery mixture ranging from −200 to +350 ppm.

4,561,892

SILICON-RICH ALLOY COATINGS

Prabhat Kumar, and Vidhu Anand, both of Kokomo, Ind., assignors to Cabot Corporation, Boston, Mass.

Filed Jun. 5, 1984, Ser. No. 617,010

Int. Cl.[4] C23C *7/00*; C22C *19/03, 19/07*

U.S. Cl. 75—251 **10 Claims**

1. A metal alloy powder, substantially less than 75 microns in particle size, for use in spray coating processes, said alloy consisting essentially of, in weight percent, 7 to 19 silicon, up to 5 copper, 76 to 93 total nickel and cobalt, plus impurities.

4,561,893

ALLOY STEEL POWDER FOR HIGH STRENGTH SINTERED PARTS

Shigeaki Takajo, Chiba, Japan, assignor to Kawasaki Steel Corporation, Kobe, Japan

Filed Sep. 25, 1984, Ser. No. 654,369

Claims priority, application Japan, Sep. 29, 1983, 58-179211

Int. Cl.[4] C22C *38/16*

U.S. Cl. 75—251 **2 Claims**

1. An alloy steel powder for high strength sintered parts consisting essentially of 0.4–1.3% by weight of Ni, 0.2–0.5% by weight of Cu, the total amount of Ni and Cu being 0.6–1.5% by weight, 0.1–0.3% by weight of Mo and the remainder being not more than 0.02% by weight of C, not more than 0.1% by weight of Si, less than 0.3% by weight of Mn and not more than 0.01% by weight of N respectively in the incidental mixed amount and substantially Fe.

4,561,894

CALCIUM OXIDE BASED FLUX COMPOSITIONS

Paul I. Fontaine, Solihull; Evan T. R. Jones, Sutton Coldfield, and John K. Batham, Brierley Hill, all of England, assignors to Foseco International Limited, Birmingham, England

Continuation of Ser. No. 535,159, Sep. 23, 1983, abandoned. This application Jul. 18, 1985, Ser. No. 756,569

Claims priority, application United Kingdom, Oct. 16, 1982, 8229624

Int. Cl.[4] C22B *9/10*; C21C *7/00*

U.S. Cl. 75—257 13 Claims

1. A particulate flux composition which comprises particles comprising 35–70% by weight calcium oxide and at least 20% by weight of at least one other component of each of said particles selected from the group consisting of alumina and iron oxide, and in which each of said particles has a substantially vitreous amorphous structure.

4,561,895

NON-ABRASIVE METAL CLEANING AGENT

Jan-Olof Eriksson, Torget, 4, S-931 31 Skellefteå, Sweden

PCT No. PCT/SE83/00075, § 371 Date Nov. 9, 1983, § 102(e) Date Nov. 9, 1983, PCT Pub. No. WO83/03253, PCT Pub. Date Sep. 29, 1983

PCT Filed Mar. 8, 1983, Ser. No. 557,171

Int. Cl.[4] C09G *1/18*

U.S. Cl. 106—3 2 Claims

1. A non-abrasive metal polish or cleaning agent for removing a discoloring film from objects while no visible residues are coated on the objects, particularly household objects and ornaments, having surfaces of copper, silver or chromium or of any alloy which is comprised predominately of any of these metals either separately or together, wherein the active ingredients of the polish consist of in manufacture an aqueous solution containing 1–3% by weight nitric acid, and 5–10% by weight thiourea or a derivative thereof.

4,561,896

CORROSION INHIBITING COATINGS

Cyril F. Drake, Harlow; Gladys M. Jones, Epping, and Ronald Jones, Sawbridgeworth, all of England, assignors to ITT Industries, Inc., New York, N.Y.

Filed Feb. 16, 1983, Ser. No. 466,958

Claims priority, application United Kingdom, Mar. 30, 1982, 8209284

Int. Cl.[4] C08K *3/40*; C09D *5/10*

U.S. Cl. 106—14.12 8 Claims

1. A paint formulation for inhibiting corrosion of a metal surface, said paint formulation including a particulate sacrificial metal for said metal surface, said sacrificial metal being selected from the group consisting of zinc, aluminum and cadmium, and a particulate water soluble glass having corrosion inhibiting properties.

4,561,897

AQUEOUS STABLE MAGNESIUM HYDROXIDE SUSPENSIONS WHICH ARE DISPERSIBLE IN OIL

John D. Zupanovich, and John G. Myers, both of Pittsburgh, Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 460,328, Jan. 24, 1983, abandoned. This application Aug. 16, 1984, Ser. No. 641,529

Int. Cl.[4] C09K *3/00*

U.S. Cl. 106—14.14 10 Claims

1. An aqueous stable magnesium hydroxide suspension having a viscosity of not more than 2500 centipoise as measured by a Brookfield RVF Viscometer at 25° C., which is dispersible in oil, consisting essentially of a mixture of:

(a) a 33 to 60 percent, by weight, aqueous slurry or paste of magnesium hydroxide; and

(b) at least 1 percent, by weight, based on the weight of said slurry or paste, of an alkyl benzene sulfonate emulsifier.

4,561,898

HARDENER FOR SILICATE SOIL STABILIZERS

Hans Fehr, Duesseldorf; Wolfgang Pesch, Grevenbroich, and Wolfgang Friedemann, Neuss, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Sep. 20, 1984, Ser. No. 652,793

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1983, 3335489

Int. Cl.[4] C09J *1/02*

U.S. Cl. 106—74 16 Claims

2. A soil stabilizer formulation comprising:

an aqueous alkali metal silicate solution; and

a hardener composition consisting essentially of about 20 to 60% by weight of dimethyl carbonate and the balance to 100% by weight of diethyl carbonate, said hardener composition being present in about 4 to 11% by weight based on the total weight of the formulation.

4,561,899

PIGMENT TONERS WITH IMPROVED TRANSPARENCY

Howard Matrick, Highlands, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 21, 1984, Ser. No. 673,925

Int. Cl.[4] C08L *1/08*

U.S. Cl. 106—193 P 6 Claims

1. A crystal stable yellow mono-azo pigment having an average particle size of 0.02 to 0.8 μm, said pigment having on its surface a crystal growth inhibitor compound having a substantially similar chemical structure as said pigment, being more soluble than the pigment in solvents used to disperse the pigment, the inhibitor compound not fitting within the crystal lattice of the pigment.

4,561,900

USE OF NOVEL AMINES AS BASES FOR THE PREPARATION OF EMULSIONS OF HYDROCARBON BINDERS

René A. Brouard, L'Isle-Adam, and Jean C. Tracez, Arras, both of France, assignors to Ceca S.A., France

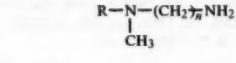
Division of Ser. No. 220,242, Dec. 23, 1980, abandoned. This application Jul. 22, 1982, Ser. No. 400,903

Int. Cl.[4] C08L *91/00*, *95/00*

U.S. Cl. 106—246 5 Claims

1. A method for producing an aqueous emulsion of a hydrocarbon binder which comprises:

(a) adding a diamine and an acid to an aqueous medium to produce an emulsifying soap of said acid with said diamine in said aqueous medium, said diamine having the formula



wherein R is saturated or non-saturated alkyl of from 8 to 22 carbon atoms and n is a number between 2 and 6, and

(b) mixing said emulsifying soap in said aqueous medium with a hydrocarbon binder.

4,561,901

EMULSIFIERS FOR BITUMINOUS EMULSIONS

Peter Schilling, Charleston, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed Oct. 5, 1984, Ser. No. 657,936

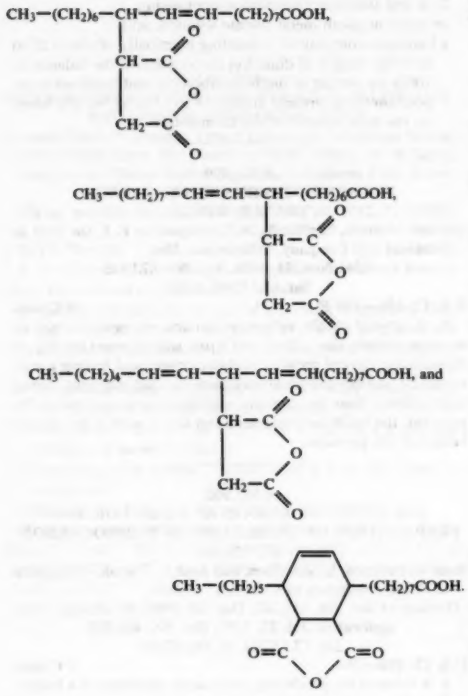
The portion of the term of this patent subsequent to Jan. 22, 2002, has been disclaimed.

Int. Cl.[4] C08L *95/00*

U.S. Cl. 106—277 22 Claims

1. Amphoteric emulsifiers for anionic and cationic bitumi-

nous emulsions consisting of reaction products of nitrogen-containing intermediates with compounds selected from the group consisting of formaldehyde and sodium sulfite or bisulfite, formaldehyde and phosphorus acid, haloalkane sulfonic acid salts, γ-propane sultone, haloalkane phosphonic acids, acrylic acid, fumaric acid, maleic acid, haloalkanoic acids wherein the nitrogen-containing intermediates are selected from the group of reaction products of polyamines reacted with a polycarboxylic acid anhydride of the following formulae:



4,561,902

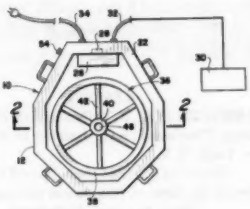
ULTRASONIC METHOD AND APPARATUS FOR CLEANING TRANSMISSIONS

Cecil D. Lee, 1809 E. 11th, Tulsa, Okla. 74104

Continuation of Ser. No. 471,890, Mar. 3, 1983, abandoned. This application Oct. 18, 1984, Ser. No. 662,525

Int. Cl.⁴ B08B *3/12*

U.S. Cl. 134—1 **10 Claims**



9. A method of cleaning assembled transmissions comprising the steps of providing a reservoir of cleaning liquid, heating the cleaning liquid, impressing ultrasonic energy on the cleaning liquid from an output surface of an ultrasonic transducer to cavitate the cleaning liquid, immersing the assembled transmission in the cavitated cleaning liquid at an area spaced from the output surface of the ultrasonic transducer, rotating the transmission within the cavitated cleaning liquid about an axis so that the entire outer periphery of the transmission longitudinal of said axis is passed across the output surface of the ultrasonic transducer in preselected spaced relation with respect thereto whereby the interior and exterior of the transmission are simultaneously cleaned without disassembly of the transmission during the cleaning operation.

4,561,903

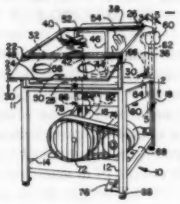
METHOD OF SOLVENT SPRAY CLEANING IN AN ENCLOSED CHAMBER

Ronald L. Blaul, Crystal Lake, Ill., assignor to Trigent, Inc., McHenry, Ill.

Continuation of Ser. No. 410,589, Aug. 23, 1982, abandoned, Division of Ser. No. 275,965, Jun. 22, 1981, Pat. No. 4,433,698. This application Nov. 16, 1984, Ser. No. 672,145

Int. Cl.⁴ B08B *3/02*

U.S. Cl. 134—10 **13 Claims**



9. High pressure process utilizing spray and runoff for the cleaning, by eye in a glove box machine, of articles to be cleaned when enclosed in the machine and by means of pressurized liquid, said machine having a sealed transparent viewing window susceptive to fogging, and sealed glove box gloves extending therebelow into the machine for manipulating said articles therein, said machine providing by closed system a fully enclosed spray chamber of essentially vapor tight integrity, said chamber by the integrity of its enclosure defining a spray chamber atmosphere, and said process employing a prepared cleaning liquid from which splash-induced spray accumulates to a high vapor concentration in the thus confined spray chamber atmosphere,

comprising the steps of:

directing onto the article a high pressure spray of the prepared cleaning liquid in the machine producing floor runoff from the high pressure spray, and producing vapor rise-off from the high pressure spray;

simultaneous glove-manipulation of the article and by eye exposing all areas thereof to said high pressure spray;

simultaneous forced blowing in the machine of the atmosphere thereof, in an internal path of closed cycle recirculation for recycling same by blower, effectively causing vapor-to-liquid agglomeration and separation by filtering the atmosphere of its entrained vapor while on the upstream side of the blower, and directing the vapor-ridded atmosphere across an adjacent side of the viewing window so as to impinge same with a clear forced blanket of recycled drying air to defog the viewing window and to air-curtain off same from having a stagnant layer of foggy air nestling in and misting up the adjacent side thereof; and

simultaneously affording a space of confluent flow between the path for the atmosphere's closed cycle and the flow of vapor rise-off through an area in common, the common area completely enclosed by the enclosure and accommo-

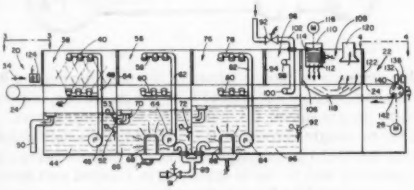
dating crossover of the vapor into the atmosphere path for admission into, and separation from atmosphere entrainment in, a vapor-to-liquid agglomerating filter located relatively upstream in the forced blown atmosphere path, all because of the overlap in operation of all steps recited.

4,561,904

CONTROL SYSTEM AND METHOD OF CONTROLLING A DISHWASHING MACHINE

Mark E. Eberhardt, Jr., Troy, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Sep. 21, 1984, Ser. No. 653,818
Int. Cl.[4] B08B *3/02*
U.S. Cl. 134—18 **14 Claims**



14. A method of controlling a conveyor-type dishwasher having a plurality of sequentially arranged work stations for performing operations on ware items located therein comprising washing, rinsing, drying operations and a conveyor for carrying the ware items into said dishwasher, past each of said stations, and out of said dishwasher, whereby each of the ware items has defined thereon a leading edge and a trailing edge, the method comprising the steps of:

defining a reference point along said conveyor near the entrance for ware to said dishwasher;

defining a series of zones of equal size arranged sequentially along said conveyor in the direction of travel of the ware for movement with said conveyor;

providing a count having an initial value and increasing said value incrementally for movement of each zone from said reference point to produce a changing current value;

determining, as a first number of said zones, the distance from said reference point to the entrance to one of said stations, and as a second number of said zones, the distance from said reference point to the exit from said one station;

sensing to detect the presence of a leading edge and a trailing edge of a ware item ware items as said ware item is moved past said reference point;

upon detecting the presence of said ledging edge, adding said first number to the current value of said count to produce a start value, and storing said start value, upon detecting the presence of said trailing edge, adding said second number to the current value of said count to produce a first stop value and storing said first stop value and, in the event an additional stop value has been previously stored whose value is greater than or equal to said start value but less than said first stop value, eliminating said additional stop value;

upon the current value of said count becoming equal to said first start value, commencing operation within said one station; and

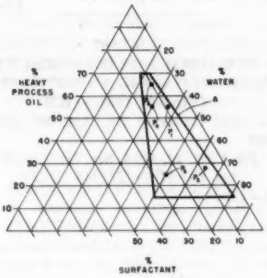
upon the current value of said count becoming equal to said stop value, halting operation within said one station.

4,561,905

METHOD FOR SUPPRESSING COAL DUST

Paul A. Kittle, c/o Valerin Technologies Limited, 87 Great Valley Pkwy., Malvern, Pa. 19355, assignor to Paul A. Kittle, West Chester, Pa.

Filed Jul. 20, 1984, Ser. No. 632,724
Int. Cl.[4] B08B *3/00*
U.S. Cl. 134—25.1 **3 Claims**



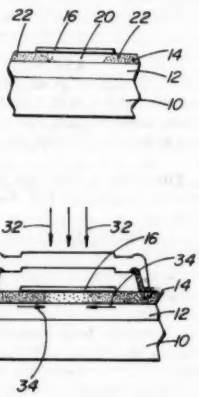
1. A method of suppressing coal dust comprising the steps of: diluting, with water, an emulsion comprising water, a surfactant and an oil in proportions in the range depicted by area A in the drawing, the oil exhibiting a tacky characteristic with respect to coal dust when in the form of a film in the absence of water and at temperatures above approximately −12° C. and up to at least approximately +21° C.; forming a foam of the diluted emulsion; and applying the foam to a falling mass of coal.

4,561,906

LASER ACTIVATED POLYSILICON CONNECTIONS FOR REDUNDANCY

Iain D. Calder, Nepean, and Hussein M. Naguib, Kanata, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Oct. 24, 1983, Ser. No. 544,497
Claims priority, application Canada, Jun. 16, 1983, 430698
Int. Cl.[4] H01L *21/265, 21/263;* B05D *3/06*
U.S. Cl. 148—1.5 **6 Claims**



1. In an integrated circuit fabrication process the method of forming a redundancy link comprising depositing a layer of polysilicon on a substrate, forming an anti-reflective coating of a region of the polysilicon layer at an intended site of the redundancy link and, using the anti-reflective coating as a

mask, raising the conductivity of parts of the polysilicon layer adjacent to said region by introducing a dopant, and electrically making said link by scanning the integrated circuit with a laser beam having a wavelength related to the anti-reflective layer such that the polysilicon is melted under the anti-reflective layer to cause diffusion of dopant into said region from the adjacent raised conductivity parts, thereby to make an electrical connection at the link, but is not melted where no anti-reflective layer overlies the polysilicon.

4,561,907

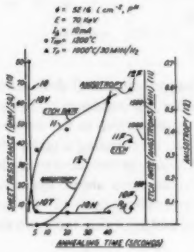
PROCESS FOR FORMING LOW SHEET RESISTANCE POLYSILICON HAVING ANISOTROPIC ETCH CHARACTERISTICS

Bruha Raicu, 1033 Crestview Dr., Apt. 307, Mountain View, Calif. 94040

Filed Jul. 12, 1984, Ser. No. 630,091

Int. Cl.[4] H01L *21/265, 21/268*

U.S. Cl. 148—1.5 **16 Claims**



1. A method for treating polysilicon material to provide low sheet resistance and anisotropic dry etching characteristics, comprising doping the polysilicon material using impurities selected from n-type and p-type impurities; heating the polysilicon material at a selected temperature using rapid thermal annealing so that the time rate of change of the sheet resistance of the polysilicon material describes a region of relatively constant slope having at least a portion thereof characterized by an annealing time span which is associated with anisotropic etching of the polysilicon material; and terminating annealing at a time within the time span.

4,561,908

METHOD OF MAKING FORGED STEEL ARTICLES, ESPECIALLY FOR VEHICLE PARTS

Rütger Berchem, Gelsenkirchen, Fed. Rep. of Germany, assignor to Berchem & Schaberg GmbH, Gelsenkirchen, Fed. Rep. of Germany

Filed Mar. 2, 1983, Ser. No. 471,515

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1982, 3207358

Int. Cl.[4] C21D *1/02, 1/06*

U.S. Cl. 148—12 F **3 Claims**

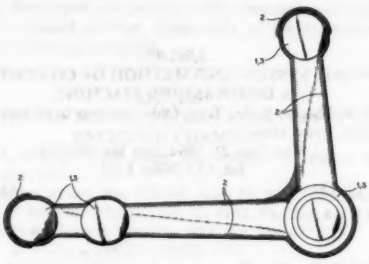
1. A method of making a vehicle body undercarriage part with high resistance to alternating-stress fatigue which comprises the steps of:

(a) forging a vehicle body undercarriage part subject to temperatures as low as −50° C. from a steel consisting essentially of 0.35 to 0.45% by weight carbon, less than 0.5% by weight silicon, 0.6 to 0.9% by weight manganese, 0.7 to 1.1% by weight chromium, 0.25 to 0.45% by weight molybdenum, 1.6 to 2.1% by weight nickel, the balance being substantially iron and the usual impurities, said part being forged with an all-around rib increasing the strength of the part and providing visible evidence of fatigue failure of the part;

(b) selectively machining portions of the forged part made in step (a); and

(c) selectively hardening those portions of the machined and forged part subject to inordinate vibration and load-directional change stresses.

3. A forged and machined vehicle suspension part adapted to be subjected to temperatures as low as −50° C., forged with an all around rib increasing the strength of the part and providing



visible evidence of fatigue failure of the part, having the following composition: 0.35 to 0.45% by weight carbon, less than 0.5% by weight silicon, 0.6 to 0.9% by weight manganese, 0.7 to 1.1% by weight chromium, 0.25 to 0.45% by weight molybdenum, 1.6 to 2.1% by weight nickel, the balance being substantially iron and the usual impurities in a forged part having high reverse-bending fatigue strength, with different portions of said part, which are subjected to inordinate vibration and load-directional change stresses, being selectively hardened.

4,561,909

METHOD OF MANUFACTURING T-3 GRADE LOW TEMPER BLACK PLATES

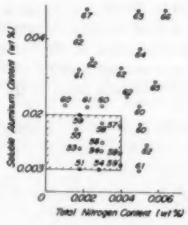
Hideo Sunami, Chiba; Hideo Kuguminato; Yoshio Izumiyama, both of Yotsukaido; Fumiya Yanagishima, Ichihara; Takashi Obara, and Kazuo Mochizuki, both of Chiba, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Continuation of Ser. No. 369,929, Apr. 19, 1982, abandoned. This application Nov. 14, 1983, Ser. No. 551,503

Claims priority, application Japan, Aug. 13, 1981, 56-125997

Int. Cl.[4] C21D *9/46*

U.S. Cl. 148—12 D **1 Claim**



1. A method of manufacturing T-3 grade low temper black plates, having an excellent corrosion resistance and a HR 30T of not less than 52 but not more than 60, by a continuous annealing process, which method comprises, after subjecting to hot rolling, a continuously cast slab of low-carbon aluminum killed steel consisting of 0.02–0.09% carbon, not more than 0.04% of silicon, 0.15–0.40% of manganese, 0.01–0.015% of soluble aluminum, not more than 0.0035% in total of nitrogen and the balance of iron and inevitable impurities, coiling the hot-rolled slab at a temperature of not less than 500° C. but less than 580° C., pickling the coiled slab and then subjecting the same to cold rolling, subjecting the cold-rolled slab to such a

continuous annealing in a continuous annealing furnace that the slab is maintained at a temperature of not less than 680° C. for a time of not less than 20 seconds, quenching up the slab to a temperature below 500° C. at a cooling rate of 10°–500° C./sec, maintaining the slab at a temperature of 350°–500° C. for a time of not less than 20 seconds, and cooling the slab to room temperature.

4,561,910

DUAL PHASE-STRUCTURED HOT ROLLED HIGH-TENSILE STRENGTH STEEL SHEET AND A METHOD OF PRODUCING THE SAME

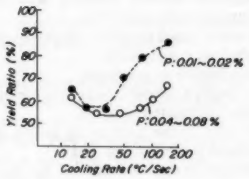
Toshiyuki Kato, Chiba; Isao Takahashi, Ichihara; Toshio Irie, Chiba, and Yozo Ogawa, Okayama, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Continuation of Ser. No. 349,635, Feb. 17, 1982, abandoned. This application Nov. 7, 1983, Ser. No. 549,221

Claims priority, application Japan, Feb. 20, 1981, 56-22879

Int. Cl.⁴ C21D *7/14*

U.S. Cl. 148—12.4 **3 Claims**



1. A method of producing a dual phase-structured hot rolled high-tensile strength steel sheet comprising producing a molten steel having a composition consisting of 0.03–0.15% by weight of C, 0.6–1.8% by weight of Mn, 0.04–0.2% by weight of P, not more than 0.10% by weight of Al, not more than 0.008% by weight of S, and the remainder being substantially Fe, forming the molten steel into a slab by a conventional method, subjecting the slab to a hot rolling under a condition that the heating temperature for the slab is kept to 1,100°–1,250° C., the finishing hot rolling temperature is kept to 800°–900° C., the coiling temperature is kept to not higher than 450° C., and the cooling rate from beginning of cooling following to hot rolling to coiling is kept to 10°–200° C./sec., according to an ordinary cooling pattern by air-cooling or water-cooling, whereby the resulting hot rolled steel sheet having a microstructure consisting of ferrite and martensite dispersed therein, the area fraction of said ferrite being at least 70%, and that of said martensite being at least 5% at the section of the steel sheet; and having a yield ratio of not higher than 70%, a tensile strength of at least 50 kg/mm^2, and a yield strength of at least 30 kg/mm^2.

4,561,911

AQUEOUS SOLUTION FOR COOLING COLD-ROLLED STEEL STRIP IN A CONTINUOUS ANNEALING PROCESS

Keiichi Tanikawa, Kanagawa; Masahiro Fujii, and Hideo Kanno, both of Fukuoka, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Aug. 30, 1984, Ser. No. 645,764

Claims priority, application Japan, Sep. 2, 1983, 58-160262

Int. Cl.⁴ C21D *1/56*; C22C *38/00*

U.S. Cl. 148—18 **17 Claims**

1. A process for cooling cold-rolled steel strips in a continuous annealing process comprising applying to the steel strips an aqueous solution of an α-amino acid or a salt of an α-amino acid.

4,561,912

FLUXES FOR CASING METALS

John H. Courtenay, Solihull, and Royston J. Phillips, Stourbridge, both of England, assignors to Foseco International Limited, Birmingham, England

Filed Sep. 7, 1984, Ser. No. 648,372

Claims priority, application United Kingdom, Sep. 22, 1983, 8325438

Int. Cl.⁴ B23K *35/24*

U.S. Cl. 148—23 **18 Claims**

1. A flux, for use in the casting of metals, in the form of granules of a composition containing carbonaceous powder in solid portions of the granules, the proportion of carbonaceous powder in the surface of the said granules being greater than the overall proportion of carbonaceous powder in the solid portions of the granules.

4,561,913

SOLDERING FLUX ADDITIVE

Frank M. Zado, Lawrence Township, Mercer County, N.J., assignor to AT&T Technologies, Inc., Berkeley Heights, N.J.

Division of Ser. No. 650,601, Sep. 14, 1984, Pat. No. 4,523,712, which is a division of Ser. No. 588,634, Mar. 12, 1984, Pat. No. 4,495,007. This application Jun. 5, 1985, Ser. No. 741,507

Int. Cl.⁴ H01L *23/48*

U.S. Cl. 148—23 **7 Claims**

1. An additive for a rosin flux which comprises:

an activator having at least one halogen atom and at least one destabilizing substituent selected from the group consisting of (a') the carboxyl group, (b') the aryl group, (c') the carbonyl group and (d') the halogen atoms; and 0 to 25 weight percent of a surfactant selected from the group consisting of (a'') a polycarboxylic acid, (b'') a hydroxyl substituent of (a''), (c'') a keto acid and (d'') a mixture of any of the foregoing surfactants and the dimer and linoleic acid.

4,561,914

SUBMERGED ARC WELDING FLUX

Vjekoslav Pavelic, Elm Grove, Wis., and Paul Tews, Cypress, Tex., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Oct. 22, 1984, Ser. No. 663,228

Int. Cl.⁴ B23K *35/34*

U.S. Cl. 148—26 **11 Claims**

1. A flux for the submerged arc welding of aluminum-bronze consisting essentially of a granular mixture which contains about 65% to about 98% of cryolite, up to about 35% by weight of alumina, up to about 35% by weight of calcium fluoride and about 2% of a binder by weight.

4,561,915

PROCESS FOR EPITAXIAL GROWTH ON A CORRUGATED WAFER

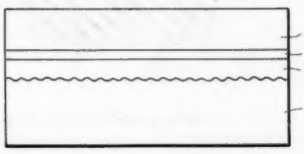
Ikuo Mito, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 26, 1984, Ser. No. 625,052

Claims priority, application Japan, Jun. 28, 1983, 58-116341

Int. Cl.⁴ H01L *21/368*

U.S. Cl. 148—171 **12 Claims**



1. A method of liquid phase epitaxial growth for epitaxially

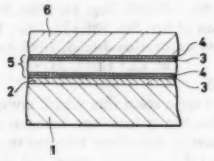
growing an $In_{1-x'}Ga_{x'}As_{y'}P_{1-y'}$ layer ($x'>0, y'>0$) on a semiconductor substrate which has a corrugation formed in an InP crystal or an $In_{1-x}Ga_xAs_yP_{1-y}$ ($x>0, y>0$) layer formed on the InP crystal on a surface thereof comprising a step of: placing a $GaAs_{1-z}P_z$ ($0.1 \leqq z > 0.8$) wafer on the surface of the semiconductor substrate until immediately before a start of the liquid phase epitaxial growth.

4,561,916

METHOD OF GROWTH OF COMPOUND SEMICONDUCTOR

Masahiro Akiyama, and Yoshihiro Akiyama, both of Tokyo, Japan, assignors to Agency of Industrial Science and Technology and Ministry of International Trade and Industry, both of Tokyo, Japan

Filed Jul. 2, 1984, Ser. No. 627,031
Claims priority, application Japan, Jul. 1, 1983, 58-118078
Int. Cl.⁴ H01L *21/20, 21/324*
U.S. Cl. 148—175 **16 Claims**



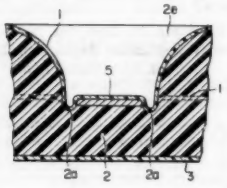
1. A method for the growth of a compound semiconductor, which comprises growing on a silicon substrate a layer of the same semiconductor as a desired Group III-V compound semiconductor at low temperatures adequate for growth of polycrystals; growing on the formed layer at least one layer of the same semiconductor as the desired Group III-V compound semiconductor and at least one layer of a Group III-V compound semiconductor having a lattice constant approximating the lattice constant of the desired Group III-V compound semiconductor, which layers are alternately disposed, at a temperature adequate for growth of a single crystal; and growing thereon a layer of the desired Group III-V compound semiconductor.

4,561,917

METHOD OF MAKING A CUSHION BODY OF SYNTHETIC RESIN

Muneharu Urai, Akishima, Japan, assignor to Tachikawa Spring Co., Ltd., Akishima, Japan

Filed Jul. 5, 1984, Ser. No. 628,144
Int. Cl.⁴ B29C *65/08;* **B32B** *31/20*
U.S. Cl. 156—73.1 **3 Claims**



1. A method of making a cushion body of synthetic resin comprising the steps of:

(a) laying at least a surface layer and a preshaped filler pad on each other;

(b) pressing the laminated structure at selected areas with a force insufficient to greatly reduce the thickness of the preshaped filter pad; and

(c) subjecting the selected areas of the laminated structure to ultrasonic heating and welding, thereby forming the laminated structure into a desired shape, and wherein said step (a) includes putting disks between the surface layer and the underlying layer, and said step (c) includes pushing the ring horn of an ultrasonic welder on said surface layer around each disc area.

4,561,918

METHOD OF MANUFACTURING CORRUGATED PAPERBOARD PRODUCT USING A FOAMED ADHESIVE

Paul M. Scharfenberg, Hurst, and Kenneth N. Findley, Jr., Arlington, both of Tex., assignors to Findley Adhesives, Inc., Elm Grove, Wis.

Continuation of Ser. No. 365,585, Apr. 5, 1982, abandoned. This application Apr. 25, 1985, Ser. No. 726,927
Int. Cl.⁴ B32B *31/14, 3/28*
U.S. Cl. 156—78 **17 Claims**

1. A process for forming a corrugated paperboard product having a corrugated medium fastened to at least one liner, wherein the improvement comprises:

providing a water-based emulsion adhesive comprising vinyl acetate ethylene copolymers;

foaming the adhesive so provided;

applying the foamed adhesive at ambient temperature to the flutes of the corrugated medium;

adhering the liner to the medium by means of the adhesive and at ambient temperatures; and

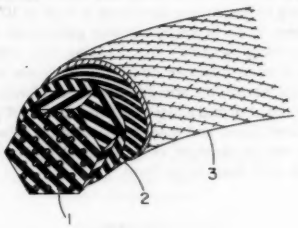
applying pressure to opposite sides of the liner and medium until the adhesive sets.

4,561,919

INSULATED BEAD FOR A RADIAL STEEL PLY TIRE

Ronald J. Forsyth, Hartville, Ohio, assignor to GenCorp Inc., Akron, Ohio

Continuation of Ser. No. 491,002, May 3, 1983, abandoned, which is a continuation-in-part of Ser. No. 297,441, Aug. 28, 1981, abandoned. This application Aug. 17, 1984, Ser. No. 641,614
Int. Cl.⁴ B29H *17/34*
U.S. Cl. 156—136 **1 Claim**



1. In the method of constructing a radial steel belted, steel ply tire having steel beads adjacent the steel body ply, the improvement of said beads comprising:

a. producing a first-stage composite by forming a strand of rubber covered steel wire into a multiple strand of substantially circular configuration, the cross-sectional area of said first-stage composite being of a substantially hexagonal shape, to form a bead bundle,

b. producing a second-stage composite by tightly envelope wrapping said first-stage composite with green natural rubber insulation obtaining thereby a second-stage composite having a substantially circular cross-section,

c. producing a third-stage composite by tightly helically

wrapping said second-stage composite with a narrow width of fabric,

d. coating said third-stage composite with an appropriate lubricant to produce a composite bead ring structure and

e. thereafter assembling said composite bead ring structure with a radial steel body ply to form a radial steel belted, steel ply tire,

said fabric preventing movement of said rubber insulation caused by the turning of said steel body ply up over the bead due to pressures incurred during molding of the tire and by forces incurred during tire operation and said composite bead ring structure preventing metal-to-metal contact between the steel of the bead and the steel of the body ply, fretting and corrosion.

4,561,920

BIAXIALLY ORIENTED OXYGEN AND MOISTURE BARRIER FILM

Ronald H. Foster, Minooka, Ill., assignor to Norchem, Inc. formerly Northern Petrochemical Company, Omaha, Nebr.

Filed Feb. 8, 1984, Ser. No. 578,073
Int. Cl.⁴ B32B *31/00*
U.S. Cl. 156—244.11 **14 Claims**

1. A method of producing a biaxially oriented oxygen and moisture barrier film which comprises:

(a) co-extruding

(1) at least one layer of a polyolefin material selected from the group consisting of polyethylene, polypropylene, and copolymers of ethylene with other olefins,

(2) at least one layer of an ethylene vinyl alcohol copolymer with a melt flow rate of at least about 8 grams per 10 minutes, and

(3) at least one adhesive layer

and combining these layers into a composite sheet wherein the adhesive is interposed between the polyolefin layer and the ethylene vinyl alcohol copolymer layers,

(b) immediately cooling the composite sheet so that the crystallinity of the ethylene vinyl alcohol copolymer is no more than about 25 percent, and

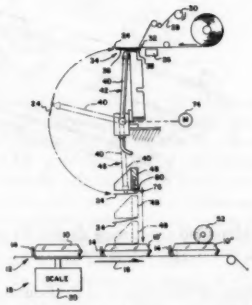
(c) biaxially orienting the composite sheet in the longitudinal direction to a degree of about 2:1 to about 4:1 and in the transverse direction to a degree of about 3:1 to about 7:1.

4,561,921

LABEL APPLICATOR AND METHOD OF LABEL APPLICATION

Fritz F. Treiber, Centerville, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed May 5, 1983, Ser. No. 491,630
Int. Cl.⁴ B65C *9/08*; B32B *31/00*; B65H *3/08*
U.S. Cl. 156—297 **12 Claims**



1. A label applicator device for receiving a label from a label printer and applying the label to a package, said label having a printed side and an opposite side which is coated with a pressure-sensitive adhesive, comprising:

label support means for receiving a label from a printer with the adhesive coated side facing upward, said label support means including a pair of fingers upon which a label rests when received by said support means, with said fingers in contact with the printed side of said label,

label transfer means, including a transfer nozzle pivotable about a fixed horizontal axis which is directly beneath said label support means, said transfer nozzle being pivotable between a first position, in which it is received between said pair of fingers to engage the printed side of said label by means of a partial vacuum supplied through a vacuum port in the transfer nozzle, and a second position, in which the adhesive coated side of said label is facing generally downward, and

applicator head means for removing a label from said transfer nozzle when said transfer nozzle is in said second position, said applicator head means defining a slot into which said transfer nozzle is pivoted into its second position and being movable vertically between an upper position in which said head receives a label from said transfer nozzle as said transfer nozzle is received into said slot, and a lower position in which said head applies a label to a package.

4,561,922

POLYURETHANE ADHESIVES WITH IMPROVED WATER RESISTANCE CONTAINING A HYDROXYMETHYL FATTY POLYOL

Dwight E. Peerman, Minnetonka, Minn., and Kurt C. Frisch, Grosse Ile, Mich., assignors to Henkel Corporation, Minneapolis, Minn.

Filed Nov. 19, 1984, Ser. No. 672,771
Int. Cl.⁴ C09J *3/14*; C08G *18/32*
U.S. Cl. 156—331.4 **8 Claims**

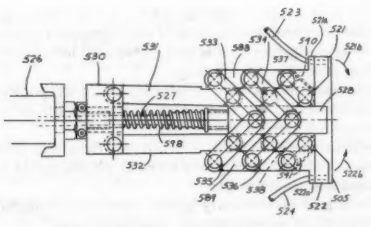
1. A method of adhesively bonding comprising (a) mixing a polyisocyanate with a polyol comprised of a hydroxymethyl fatty polyol or an alkylene oxide derivative thereof, (b) applying the mixture to a substrate and (c) contacting the applied mixture with a surface of an article to be bonded to the substrate.

4,561,923

METHOD AND APPARATUS FOR AUTOMATICALLY COILING AND TAPING ELONGATED TUBING AND THE LIKE

Benjamin DeLorenzi, Budd Lake, and Robert B. Comerford, West Millington, both of N.J., assignors to Foster & Allen, Inc., Somerville, N.Y.

Filed Sep. 30, 1983, Ser. No. 537,659
Int. Cl.⁴ B65C *9/36*
U.S. Cl. 156—350 **26 Claims**



1. Apparatus for coiling and taping lengths of a flexible strip comprising:

indexable turret means having a plurality of spindle means rotatably mounted upon said turret means;

means for advancing said flexible material towards a first spindle means station;

said turret means including means responsive to feeding of the forward end of said strip to a predetermined location for indexing said turret means;

first cam means;

said spindle means including clamping means having roller means engaging said cam means when said turret means is indexed to clamp the forward end of said strip to said spindle means;

drive means;

second cam means;

means engaging said second cam means when said turret means is indexed to couple said drive means to said spindle means for coiling said strip about said spindle means;

said spindle means including means responsive to rotation of said means through a predetermined angle for decoupling said drive means from said spindle means;

taper means including switch means responsive to indexing of said turret means to the taping station for activating said taper means;

said taper means including jaw means having swingable applicator jaws;

means for moving said jaw means;

said jaw means including means responsive to said jaw moving means for initially moving said applicator jaws adjacent to said coiled strip and thereafter swinging the applicator jaws together for taping said coiled strip.

4,561,924

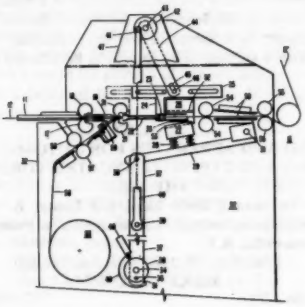
AUTOMATIC MATERIAL SPLICER FOR PHOTOGRAPHIC MATERIALS

Henry F. Hope, and Stephen F. Hope, both of 2421 Wyandotte Rd., Willow Grove, Pa. 19090

Filed Oct. 5, 1982, Ser. No. 432,832

Int. Cl.⁴ B32B *31/00;* **B65H** *19/08;* **G03D** *15/04*

U.S. Cl. 156—361 **19 Claims**



1. A photographic material splicer of the type adapted to automatically connect the ends of photographic material and a leader strip together as it is being advanced into a continuous running processor, comprising:

input feed means for introducing strips of photographic material into said photographic material splicer as it advances toward said processor,

input drive rolls spaced downstream from said input feed means for advancing said strips of photographic material and said leader strip,

a first pair of stationary guides located intermediate said input feed means and said input drive rolls,

splicing means spaced downstream from said input drive rolls, said splicing means having a movable block for attaching a piece of splicing tape onto one edge of said strips of photographic material to be processed to form a continuous strip of photographic material,

means for supplying pieces of splicing tape to said splicing means,

a second pair of stationary guides located intermediate said input drive rolls and splicing means,

reciprocating guide means extending from said second stationary guides into said splicing means opposite said movable block, said reciprocating guide means being retracted from their extended position in said splicing means to a retracted position outside said movable block when said movable block is being closed to attach a piece of splicing tape to the edges of said pieces of material in said splicing means,

means for automatically supplying a leader tape to said splicing means during the absence of strips of said photographic material in said input feed means,

sensing means located downstream from said input feed means and upstream from said splicer means for sensing the leading edge and the trailing edge of said strips of photographic material being introduced into said input feed means,

output drive means downstream from said splicing means for supplying strips of said spliced photographic material with a leader tape attached into said continuous running processor,

control means coupled to said sensing means for stopping said input feed means when the leading edge of said photographic material is in said splicing means adjacent the trailing edge of a piece of material stopped in said splicing means,

said control means further comprising means for operating said movable block to attach said splicing tape to said pieces of material opposite said movable block and then starting said input feed means and said output drive means to supply said photographic material into said continuous running processor, and

said control means further comprising means for supplying a leader tape to said splicing means when said sensing means senses the trailing edge of a last strip of photographic material being fed into said continuous running processor.

4,561,925

FOIL WELDING DEVICE

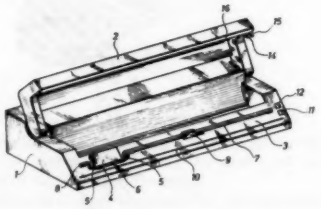
Joze Skerjanec, Titovo Velenje, and Stane Pocivalnik, Smartno Ob Paki, both of Yugoslavia, assignors to Gorenje Tovarna Gospodinjske Opreme N.Sol. O. Velenje, Titovo Velenje, Yugoslavia

Filed Mar. 25, 1983, Ser. No. 479,027

Claims priority, application Yugoslavia, Apr. 1, 1982, 726/82

Int. Cl.⁴ B32B *31/00, 19/02;* **B44C** *7/04;* **B65B** *7/06*

U.S. Cl. 156—379.6 **4 Claims**



1. A welding and evacuating device for sealing a thermoplastic bag, said device comprising:

a housing;

an operating surface located on the front side of the housing;

a welding wire extending longitudinally across the operating surface for welding the sides of the top of said bag together;

suction means projecting from the operating surface adja-

cent one end of the operating surface for evacuating air from said bag;

a slot defined between the suction means and the operating surface for receiving one side of the top of the bag;

an extension protruding from each of two opposed sides of the suction means for holding said one side of the top of the bag in a filling position while the other side of the top of the bag is held by an operator who is filling the bag, the top of the bag thereby being horizontally oriented;

a cover pivotably mounted on the housing;

a pressing ledge located on the bottom surface of the cover, the ledge, in a closed condition of the cover, pressing against the welding wire;

a sealing ledge extending from the suction means to the other end of the operating surface, in parallel with the welding wire;

a strainer slidably mounted on said sealing ledge, said strainer operating in a raised position and a closed position, said strainer in said raised position being slidable on the ledge, and said strainer in said closed position holding said other side of the top of the bag between the walls of the strainer and the ledge when the top of the bag is stretched across the sealing ledge from said suction means towards said other end of the operating surface, said strainer embracing the furthest extension of the top of the bag to orient the sides of the top of the bag one against the other except for where the suction means is inserted between the sides of the top of the bag;

means for activating said suction means; and

means for energizing said welding wire.

4,561,926

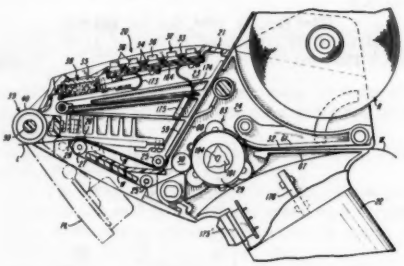
LABELER

Paul H. Hamisch, Jr., Franklin, and John D. Mistyurik, Tipp City, both of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 484,344, Apr. 12, 1983, Pat. No. 4,477,305. This application Sep. 10, 1984, Ser. No. 649,083

Int. Cl.⁴ B65C *11/02*

U.S. Cl. 156—381 **1 Claim**



1. A hand-held labeler adapted to print and apply pressure sensitive labels releasably secured to a carrier web, comprising: a housing, a manually engageable handle connected to the housing, means for printing on labels, the printing means including an electrically selectable print head having a plurality of printing elements, a platen, means for delaminating printed labels, means for applying printed labels, means for advancing the carrier web, means defining a path for guiding the web from the label roll, to the printing means, to the delaminating means, and to the web advancing means, a support for the platen, wherein the support is movable between an operating position and a fully open position through a partially open position, and means for releasably latching the support in the partially open position.

4,561,927

APPARATUS FOR THE MANUFACTURE OF TIRES

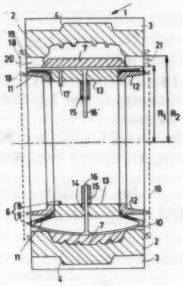
Anthony J. M. Sumner, Welford-on-Avon, England, assignor to Apsley Metals Limited, London, England

Filed Apr. 25, 1984, Ser. No. 603,697

Claims priority, application United Kingdom, May 10, 1983, 8312863

Int. Cl.⁴ B29C *1/12*; B29H *5/18*

U.S. Cl. 156—406.2 **9 Claims**



1. An apparatus for expanding an annular tire component into a ring comprising an inflatable expandable annular pressure vessel formed by a radially extensible annular inflatable diaphragm attached to a cylindrical carrier drum and guide means capable of radially outward movement secured to the central region of the diaphragm for accurately controlling in a predetermined manner the axial position of the bag with respect to the carrier drum.

4,561,928

LABELLING MACHINE

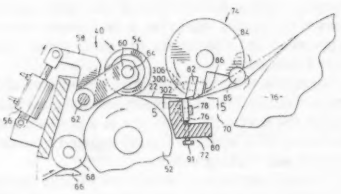
Martin D. Malthouse, 204 Glen Rd., Toronto, Ontario, Canada

Division of Ser. No. 313,850, Oct. 22, 1981, Pat. No. 4,447,280. This application Mar. 22, 1984, Ser. No. 569,810

Claims priority, application Canada, Oct. 24, 1980, 363170

Int. Cl.⁴ B26D *1/38, 7/18*

U.S. Cl. 156—497 **4 Claims**



1. For use in labelling machine having a feed mechanism to feed a strip of labels along a predetermined label path and into engagement with a label carrier, a cutter assembly located in said path for severing labels from said strip, said cutter assembly comprising a fixed support, a first cutting element attached to said fixed support to extend transverse to said strip, a rotatable knife carrier mounted for rotation about a first axis, a second knife element attached to said rotatable knife carrier for movement therewith, drive means to rotate said rotatable knife carrier about said first axis and move said second knife element past said first knife element to produce a cutting action, and release means to release said strip from said knife elements after said cutting action, said release means including a plurality of nozzles formed at the peripheral surface of said rotatable knife carrier at spaced locations along an axis generally parallel to the rotational axis of said rotatable knife carrier and being

circumferentially spaced from said second knife element, to follow said second knife element past said first element and manifold means to control flow of air to said nozzles, from a source of pressurized air, said manifold means including port means to connect said nozzles selectively with said source upon rotation of said rotatable knife carrier and provide an intermittent air flow from said nozzles, whereby a plurality of air jets impinge on said web subsequent to severance thereof by said knife elements to separate said strip from said second knife element.

4,561,929

APPARATUS FOR APPLYING AN ADHESIVE STRIP OF PLASTIC TO A GLASS PANE

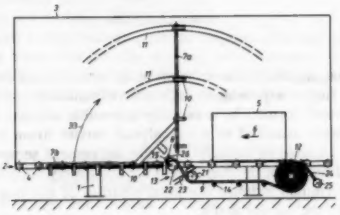
Karl Lenhardt, Industriestrasse 2-4, 7531 Neuhausen-Hamberg, Fed. Rep. of Germany

Filed Jan. 31, 1985, Ser. No. 696,700

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1984, 3404006

Int. Cl.⁴ B32B *31/10*

U.S. Cl. 156—522 **7 Claims**



1. Apparatus for applying to a glass pane a plastic strip, which is adhesive on two mutually opposite, parallel side faces and comprises a plastic material, a moisture-absorbing substance and a metal strip that extends between said two side faces and in the longitudinal direction of the plastic strip, which plastic strip is applied to said glass pane to extend continuously along the periphery of said glass pane at a predetermined distance from the edge of said pane, characterized in that said apparatus comprises

conveying means for conveying the glass panes, which conveying means comprise a horizontal conveyor for supporting and conveying the glass panes standing on their lower edge,

backing means, which extend above the horizontal conveyor and are adapted to laterally support the glass panes standing on the horizontal conveyor in a predetermined plane of conveyance, which is slightly inclined from the vertical toward said backing means,

pressure-applying means, which are slightly spaced above the horizontal conveyor and serve to force the plastic strip against a moving glass pane which is in contact with one adhesive side face of the plastic strip,

a strip feeder, which is operable to move in synchronism with the horizontal conveyor at the same speed as the latter to feed the plastic strip to the pressure-applying means,

a turning mechanism, which when the horizontal conveyor is at a standstill is adapted to turn each glass pane through 90° opposite to the normal direction of travel of the horizontal conveyor about an axis which is spaced slightly above the pane-supporting plane of the horizontal conveyor and extends at right angles to said plane of conveyance,

strip-guiding means, which are disposed adjacent to and cooperate with the pressure-applying means and are arranged to act on the top of the plastic strip at least during the turning operation, and

severing means for severing strip sections in the required length from a plastic strip supply.

4,561,930

PROCESS FOR THE PRODUCTION OF COARSELY CRYSTALLINE SILICON

Ingo Schwirtlich; Peter Woditsch, and Wolfgang Koch, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 13, 1984, Ser. No. 589,203

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1983, 3310827

Int. Cl.⁴ C30B *9/04*

U.S. Cl. 156—616 R **4 Claims**

1. A process for the production of columnarly grown blocks of silicon containing coarsely crystalline regions comprising cooling a silicon melt in a mold, selectively effecting solidification at the melt surface and advancing the solidification front downwardly.

4,561,931

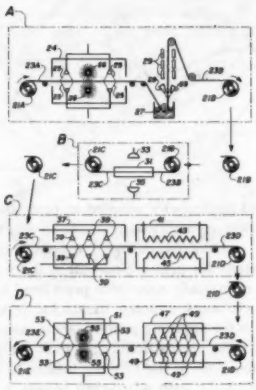
METHOD INCLUDING PRODUCING A STENCIL FROM LAYER OF DICHROMATE-SENSITIZED PVA AND FLUORESCEIN-TYPE DYE

Peter M. Ritt, West Lampeter Township, Lancaster County, and Mary L. Saulnier-Ebert, Upper Leacock Township, Lancaster County, both of Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Dec. 21, 1984, Ser. No. 685,065

Int. Cl.⁴ C23F *1/02*; B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—640 **18 Claims**



12. In a method for producing an apertured mask for a cathode-ray tube, the steps comprising

(a) applying to each major surface of a metal sheet a coating

of a liquid, water-based acidic coating consisting essentially of polyvinyl alcohol solids, alkali dichromate photosensitizer for said polyvinyl alcohol, and an operative proportion of fluorescein-type dye,

(b) heating said coatings to produce dry photosensitive coatings on said sheet, whereby the presence of said dye in said dry coatings is operative to substantially reduce the heat-hardening of said coating,

(c) exposing said dry coatings to images of actinic radiation to selectively insolubilize irradiated portions of said dry coatings,

(d) selectively retaining said insolubilized portions of said dry coatings while removing the remainder of said coatings, thereby producing a stencil on each of said major surfaces,

(e) heating said stencils to increase the etch-resistance of said stencils,

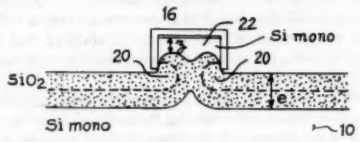
(f) and then etching said metal sheet through said stencils.

4,561,932

METHOD OF PRODUCING INTEGRATED SILICON STRUCTURES ON ISOLATED ISLETS OF THE SUBSTRATE

Yvon Gris, Tullins, and Agustin Monroy, St. Martin d'Heres, both of France, assignors to Societe pour l'Etude et la Fabrication de Circuits Integres Speciaux E.F.C.I.S., Grenoble, France

Filed Nov. 2, 1984, Ser. No. 667,587
Claims priority, application France, Nov. 4, 1983, 83 17584
Int. Cl.⁴ H01L *21/306;* **B44C** *1/22;* **C03C** *25/06, 15/00*
U.S. Cl. 156—643 **3 Claims**



1. A method for forming monocrystalline silicon islets isolated from the substrate on an integrated circuit, comprising the following steps:

a. provision of a monocrystalline semi conductor wafer which is coated, possibly after thin oxidization, with a first layer of silicon nitride,

b. etching the nitride with a pattern leaving zones of small width (FIG. 1),

c. vertical hollowing out of the monocrystalline silicon outside the places protected by the nitride, so that monocrystalline silicon islets remain whose upper surface is coated with nitride (FIG. 2),

d. deposition of the second silicon nitride layer which covers the surface of the wafer as well as the sides of the islet and the first nitride layer (FIG. 3),

e. vertical anisotropic etchinq of the nitride until the silicon is bared outside the islets, the nitride of the second layer then remaining on the sides of the islets and that of the first layer remaining on the top of the islets (FIG. 4),

f. isotropic etching of the bared silicon outside the islets protected by the nitride, this etching extending partially under the islets (FIG. 5),

g. thick thermal oxidization of the wafer for a time sufficient for a silicon oxide layer to be formed extending completely under the islets and isolating them dielectrically from this substrate (FIG. 6),

h. the nitride layer remaining on the islets is removed.

4,561,933

XEROGRAPHICS DEINKING

Donald L. Wood, Houston, Tex., and Donald C. Wood, Des Plaines, Ill., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 542,636, Oct. 17, 1983, abandoned. This application Apr. 15, 1985, Ser. No. 723,705
Int. Cl.⁴ D21B *5/02*
U.S. Cl. 162—5 **19 Claims**

1. A process for the deinking of wastepaper stocks comprising xerographically printed paper, which comprises steps for

(a) converting the wastepaper to a pulp,

(b) contacting the pulp with an aqueous medium of alkaline pH containing a deinking agent consisting of a mixture of (i) one or more C_8 to C_{16} alkanols and (ii) a mixture of alcohol ethoxylates, to form a suspension of the ink in the aqueous pulp-containing medium, said deinking agent containing for every 10 parts by weight of alkanol and alcohol ethoxylates between 3.7 and 4.7 parts alkanol and between 5.3 and 6.3 parts alcohol ethoxylates, said aqueous medium containing the deinking agent in an amount between about 0.2 and 2.0 percent by weight, calculated on dry weight of the pulp, and said contact being carried out at a temperature of between about 40° and 100° C., and

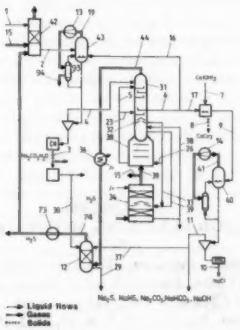
(c) treating the resulting pulp-containing medium by washing or flotation to remove suspended ink therefrom.

4,561,934

METHOD OF RECOVERING CHEMICALS FROM CHLORIDE-CONTAINING GREEN LIQUOR

Pertti K. Rimpi, Tampere, Finland, assignor to Oy Tampella AB, Tampere, Finland

Filed Sep. 28, 1983, Ser. No. 536,640
Claims priority, application Finland, Oct. 20, 1982, 823587
Int. Cl.⁴ D21C *11/04*
U.S. Cl. 162—30.1 **17 Claims**



1. A method for recovering chemicals from a chloride-containing green liquor comprising:

contacting the chloride-containing green liquor with flue gases in order to precarbonate sulfide present in the green liquor, such that the resulting solution contains chloride, hydrosulfide and sodium carbonate;

evaporation crystallizing the chloride-, hydrosulfide-, and sodium carbonate-containing solution in order to separate crystalline sodium carbonate, thereby leaving an alkaline chloride- and hydrosulfide-containing solution;

reacting the alkaline chloride- and hydrosulfide-containing solution with bicarbonate to form an alkaline sodium carbonate-, chloride-, and hydrogen sulfide-containing solution;

removing said hydrogen sulfide from the solution;

causticizing and evaporation crystallizing the resulting alkaline sodium carbonate-, and chloride-containing solution

in order to separate the chloride salt from the alkaline solution;

absorbing the hydrogen sulfide, derived from the removal of hydrogen sulfide, into a sodium carbonate solution derived from said crystalline sodium carbonate, said alkaline solution, or a mixture thereof in order to produce a solution suitable for the preparation of white liquor; and

directing the hydrogen sulfide, which remains unabsorbed, to the precarbonation stage.

6. A method for recovering chemicals from a chloride-containing green liquor comprising:

contacting the chloride-containing green liquor with flue gases in order to precarbonate sulfide present in the green liquor, such that the resulting solution contains chloride, hydrosulfide and sodium carbonate;

reacting the chloride-, hydrosulfide-, and sodium carbonate-containing solution with bicarbonate to form a chloride-, sodium carbonate-, and hydrogen sulfide-containing solution;

removing said hydrogen sulfide from the solution;

evaporation crystallizing the resulting chloride- and sodium carbonate-containing solution in order to separate crystalline sodium carbonate thereby leaving an alkaline chloride-containing solution;

causticizing and evaporation crystallizing the alkaline chloride-containing solution in order to separate chloride salt from the alkaline solution;

absorbing the hydrogen sulfide, derived from the removal of hydrogen sulfide, into a sodium carbonate solution derived from said crystalline sodium carbonate, said alkaline solution, or a mixture thereof in order to produce a solution suitable for the preparation of white liquor; and

directing the hydrogen sulfide, which remains unabsorbed, to the precarbonation stage.

4,561,935

PROCESS FOR REMOVING ANTHRAQUINONE TYPE SCALE

Kazuaki Sakai, Fujisawa; Tuneyasu Sato, Chigasaki, and Kazuhiko Chiba, Kawasaki, all of Japan, assignors to Kawasaki Kasei Chemicals Ltd., Tokyo, Japan

Division of Ser. No. 323,131, Nov. 19, 1981, Pat. No. 4,481,073. This application Jul. 18, 1984, Ser. No. 631,985

Claims priority, application Japan, Dec. 1, 1980, 55-169297; Dec. 15, 1980, 55-175745

The portion of the term of this patent subsequent to Nov. 6, 2001, has been disclaimed.

Int. Cl.⁴ D21C *11/10*; C23G *1/14*

U.S. Cl. 162—30.1 **9 Claims**

1. A process for removing scale containing anthraquinone or precursors of anthraquinone formed on condenser surfaces upon condensation of a vapor evaporated from a black liquor, said black liquor being obtained by separating pulp from a digested mixture of lignocelluloses containing an anthraquinone type digesting assistant, the process comprising contacting said surfaces having anthraquinone scales adhered thereto with a heated aqueous solution of a base and a reducing agent in an amount effective to dissolve the anthraquinone component, wherein said base is used in the ratio of 0.6 to 5.0 by wt. of the stoichiometric amount based on the anthraquinone component in the scale.

4,561,936

PROCESS FOR THE CONVERSION OF LIGNOCELLULOSIC MATERIAL TO CELLULOSE PULP BY ALKALINE PREOXIDATION FOLLOWED BY ALKALINE OXYGEN-FREE DIGESTION BOTH IN THE PRESENCE OF A REDOX ADDITIVE

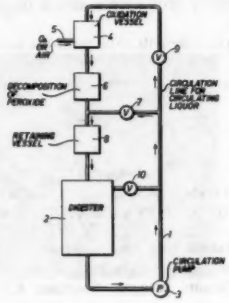
Hans O. Samuelson, Gothenberg, Sweden, assignor to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden

Continuation-in-part of Ser. No. 77,443, Sep. 20, 1979, abandoned. This application Aug. 24, 1981, Ser. No. 295,923

Claims priority, application Sweden, Sep. 22, 1978, 78-09959

Int. Cl.⁴ D21C *3/02, 3/04, 3/20*

U.S. Cl. 162—45 **37 Claims**



1. A process for the essentially sulphur-free delignification of particulate lignocellulosic material that does not require oxygen during the delignification stage, with a short digestion time at high temperature, which comprises:

(1) subjecting the lignocellulosic material to a preoxidation using an alkaline liquor at a temperature below 140° C. in the presence of at least one redox additive that is converted into a reduced form during reaction with the lignocellulosic material;

(2) withdrawing the reduced form of the redox additive with alkaline liquor and oxidizing the reduced form by oxygen gas in the absence of the lignocellulosic material at a rate sufficient to maintain the oxidized form of the redox additive in a major proportion and the reduced form in a minor proportion throughout the preoxidation;

(3) continuing the preoxidation so that reducing sugar end groups in the lignocellulosic material are oxidized to aldonic acid end groups; and

(4) then converting the lignocellulosic material to chemical cellulose pulp by delignification using strong alkali in the presence of at least one redox additive at a temperature within the range from about 160° to 200° C. without any addition of oxygen-containing gas.

4,561,937

APPARATUS FOR TRIMMING THE EDGE OF A WEB DURING FORMATION USING A DRAINAGE INTERRUPTING MASK

Martin B. Keller, Hudson Falls, N.Y., assignor to Sandy Hill Corporation, Hudson Falls, N.Y.

Filed Aug. 1, 1983, Ser. No. 519,116

Int. Cl.⁴ D21C *11/02*; D21G *9/00*

U.S. Cl. 162—286 **2 Claims**

1. In a Fourdrinier machine for forming a web from a pulp slurry upon a driven endless foraminous wire having a certain longitudinal axis of movement of the type including an upwardly-inclined run of the wire defining a web-forming surface and a headbox for discharging the slurry onto the upwardly-inclined run and a plurality of adjacent suction devices in stepped relationship as to each other and disposed transversely of and beneath the ascending run; the improvement in a drain-

age control subassembly positionable at one side of the machine width within the web-forming area and comprising:

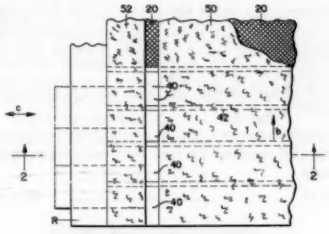
a plurality of spaced keys each extending transversely across the machine width within the web-forming area immediately beneath the wire and above a respective line of joinder between respective adjacent suction devices,

a plurality of masks each being adjustably movable laterally relative to the longitudinal axis of wire movement and interdigitated with respective adjacent keys at one side of the machine for restricting the area of contact of the vacuum from a respective suction device with the slurry on the web-forming surface immediately thereabove,

the keys and masks being arranged with tongue and groove configurations for the sliding movement of each mask relative to each respective pair of keys,

the masks of the plurality thereof being arranged in parallelism in alignment with the longitudinal axis of wire movement in delineating a strip having a width corresponding to the width of the masks and disposed at a distance inboard of the side edge of the wire according to the preselected positioning of the masks relative to the wire, the strip defining an area longitudinally of and below the forming web whereat drainage is precluded so as to divide the forming web into a main body portion and a side edge trim portion at opposite sides of the strip.

2. In a Fourdrinier machine for forming a web from a pulp slurry upon a driven endless foraminous wire having a certain longitudinal axis of movement of the type including an upwardly-inclined run of the wire defining a web-forming surface



and a headbox for discharging the slurry onto the upwardly-inclined run and a plurality of adjacent suction devices in stepped relationship as to each other and disposed transversely of and beneath the ascending run; the improvement in a drainage control subassembly positionable at opposite sides of the machine width within the web-forming area and comprising:

a plurality of spaced keys each extending transversely across the machine width within the web-forming area immediately beneath the wire and above a respective line of joinder between respective adjacent suction devices,

a plurality of masks each being adjustably movable laterally relative to the longitudinal axis of wire movement and interdigitated with respective adjacent keys at each side of the machine for restricting the area of contact of the vacuum from a respective suction device with the slurry on the web-forming surface immediately thereabove,

the keys and masks being arranged with tongue and groove configurations for the sliding movement of each mask relative to each respective pair of keys,

the masks of the plurality thereof at each side being arranged in parallelism in alignment with the longitudinal axis of wire movement in delineating at each side a strip having a width corresponding to the widths of the masks and disposed at a distance inboard of the respective side edge of the wire according to the preselected positioning of the masks relative to the wire, the strips defining areas longitudinally of and below the forming web whereat drainage is precluded so as to divide the forming web into a main body portion and side edge trim portion at the respective opposite sides of the strips.

4,561,938

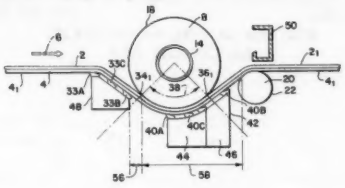
FORMING ROLL APPARATUS

Otto J. Kallmes, Marblehead, Mass., assignor to M/K Plank Corporation, Danvers, Mass.

Continuation-in-part of Ser. No. 581,124, Feb. 17, 1984, abandoned. This application Aug. 21, 1984, Ser. No. 642,823

Int. Cl.⁴ D21F *1/40, 1/50*

U.S. Cl. 162—314 **19 Claims**



1. Apparatus for use in the forming section of a papermaking machine for use in producing a paper-like material upon a forming medium having a horizontal forming surface arranged for movement through a horizontal plane wherein in forming said paper-like material, said material is initially formed upon said forming medium to engage a forming roll as a web/stock sandwich and subsequently disengage said forming roll as a fully-formed web, said apparatus comprising in combination:

(a) a forming roll not having internal suction means or supplementary belts positioned adjacent a web contacting surface of said forming medium, said roll having a stock-engaging surface, said roll being located a distance downstream along said horizontal forming surface;

(b) first directing means positioned on the side of said forming medium which does not contact said web and spaced upstream of said forming roll for directing said web/stock sandwich carried by said forming medium into engagement with said roll surface in the absence of negative pressure means, which induces negative pressure upon said web through said forming medium, in the area between said first directing means and where said web/stock sandwich first engages said roll surface;

(c) second directing means positioned on the side of said forming medium which does not contact said web and spaced downstream of said forming roll for directing said fully-formed web carried by said forming medium away from said stock engaging surface, said first and second directing means engaging the side of said forming medium which does not contact said web and together sandwiching said web/stock sandwich between said forming medium and a substantial arc segment of said stock engaging surface of said roll in the absence of positive pressure means, which exerts positive pressure upon said web through said forming medium, in an area which includes said area formed by said substantial arc segment and extends to said second directing means;

(d) suction means positioned on the side of said forming medium which does not contact said web/stock sandwich and between said first and second directing means for providing negative pressure through said forming medium in at least a portion of said area which includes said area formed by said substantial arc segment and extends to said second directing means, said at least a portion including a portion of said substantial arc segment formed with said roll and a portion of the area between said substantial arc segment formed by said roll and said second directing means; and,

(e) said suction means comprising a plurality of vacuum inducing hydrofoil blades which extend across the width of said machine including a first blade and at least one

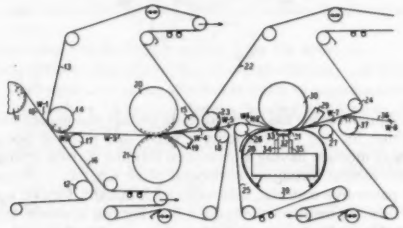
other succeeding blade, each of said at least one other succeeding blades being downstream of said first blade and any other preceding blade, said plurality of hydrofoil blades being positioned beneath the forming medium adjacent to said roll at said portion of said substantial arc segment formed with said roll and said portion of said area between said substantial arc segment formed by said roll and said second directing means.

4,561,939

EXTENDED NIP PRESS ARRANGEMENT

Edgar J. Justus, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Mar. 26, 1984, Ser. No. 593,257
Int. Cl.[4] D21F *3/04*
U.S. Cl. 162—360.1 **1 Claim**



1. A paper machine structure comprising in combination:
a web forming wire having a downwardly extending run;
a first upper press felt with a pick-up roll therein arranged in close running relationship with the wire to transfer a web thereform onto the first felt;
a second lower felt guided into pressing relationship with the first felt to sandwich a web therebetween;
a first press roll couple with upper and lower press rolls forming a first press nip pressing the first and second felts therebetween with said rolls being open rolls;
a web transfer suction shoe within the lower felt transferring the web to the lower felt following the first nip;
a third upper press felt arranged in close running relationship with the second felt and having a suction roll therein to transfer the web from the second felt to the third felt;
a fourth lower press felt passing through the second nip with the web therebetween;
an endless impervious belt arranged to meet the fourth felt and carry the web through an extended second nip;
an upper roll and a lower concave shoe forming the extended second nip with the lead end of the shoe relieved to form a dynamic film of fluid between the belt and shoe;
an arcuate stationary guide surface means within the the belt to guide it in operation in a substantially annular path;
a fluid piston and cylinder beneath the shoe to support it and provide pressure within the extended press nip;
a suction transfer shoe within the third felt following the second nip to transfer the web to the third felt;
and a fifth felt positioned in close running relationship with the third felt with a suction means therein to transfer the web to the fifth felt.

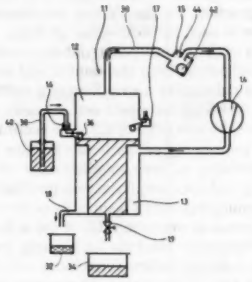
4,561,940

OVERCHARGE PREVENTION ARRANGEMENT

René Meier, Lucerne, Switzerland, assignor to Mentec Ag, Luzern, Switzerland

Filed Jul. 9, 1984, Ser. No. 629,257
Int. Cl.[4] B01D *3/42*; F16K *31/18*
U.S. Cl. 202—181 **4 Claims**

1. In an overflow prevention arrangement for monitoring the level of a fluid surface in a vacuum evaporator of a solvent processing plant having a vacuum pump, a condenser combined with said vacuum evaporator, a feed valve, a condensate trap containing a ball valve, a condensate drain and a drain valve, the improvement which comprises:
an overcharge valve arranged in the vacuum evaporator;
said overcharge valve including:
a double-arm lever having a first end and a second end;
a float body arranged upon said first end of said double-arm lever and being acted upon by gravity to generate a weight force;
a valve plunger hinged to said second end of said double-arm lever;



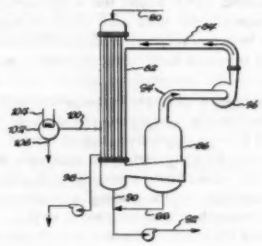
a free-floating valve;
a valve seat cooperating with said free-floating valve;
the overcharge valve being held in a closed position sealing a vacuum by said weight force transmitted from said float body by said valve plunger through said free-floating valve to said valve seat;
said fluid surface exerting a buoyant action upon said float body; and
the overcharge valve being placed in an open position breaking said vacuum by said buoyant action upon said float body.

4,561,941

ESSENCE RECOVERY PROCESS

Derek F. Dinnage, and George F. Worrall, both of Tonawanda, N.Y., assignors to APV Equipment, Incorporated, Tonawanda, N.Y.

Filed Nov. 26, 1982, Ser. No. 444,783
Int. Cl.[4] B01D *1/26, 3/02*
U.S. Cl. 203—24 **6 Claims**



1. In association with a method of concentrating fruit juices by evaporation, a continuous essence recovery process of high thermal efficiency comprising the following steps providing an excess of superheated vapor by vapor recompression and desuperheating sufficient to recover up to substantially all of said essences by:
(a) mechanically compressing vapors boiled off from a feed

of fruit juice to provide the total energy input for the ongoing process;

(b) using the mechanically compressed vapors to boil away essence bearing vapors from an initial feed of fruit juice;

(c) partially condensing the essence bearing vapors in the vapor side of an evaporator, the excess heat produced by the compressing step producing an outflow of essence enriched vapors; and

(d) a condensing the essence enriched vapors to recover the essence.

4,561,942

ISOLATION OF METHYL 4-PENTENOATE FROM MIXTURES CONTAINING THIS AND METHYL 3-PENTENOATE

Heinz-Walter Schneider, Ludwigshafen; Rudolf Kummer, Frankenthal, and Dieter Zimmerling, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 28, 1985, Ser. No. 717,108

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1984, 3412295

Int. Cl.[4] B01D *3/36;* **C07C** *67/54*

U.S. Cl. 203—96 **2 Claims**

1. A process for the isolation of methyl 4-pentenoate from a mixture containing this and methyl 3-pentenoate, wherein from 0.25 to 0.4 part by weight of water is added to the mixture per part by weight of methyl 4-pentenoate, and the azeotrope of methyl 4-pentenoate and water is distilled off.

4,561,943

PROCESS FOR PREPARING SURFACE-TREATED STEEL STRIPS ADAPTED FOR ELECTRIC RESISTANCE WELDING AND STRIPS PRODUCED BY SAID PROCESS

Kazuo Mochizuki; Hisatada Nakakoji; Toshio Ichida; Toshio Irie; Hajime Ogata, and Kyoko Yamaji, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Jul. 6, 1984, Ser. No. 628,265

Claims priority, application Japan, Jul. 8, 1983, 58-124235; Nov. 26, 1983, 58-222372

Int. Cl.[4] C25D *5/12*

U.S. Cl. 204—28 **21 Claims**

1μm

12. Process for preparing a surface-treated steel strip adapted for electric resistance welding, comprising the steps of

forming a first layer of iron-nickel alloy on a steel strip, said first layer having a weight ratio of Ni/(Fe+Ni) in the range between 0.02 and 0.50 and a thickness of 10 to 5,000 angstroms,

forming a second layer of tin or iron-tin-nickel alloy on said first layer by tin plating to a coating weight of 0.1 to 1 g/m^2 of tin, and

forming a third layer on said second layer by effecting an electrolytic chromate treatment, said third layer consisting essentially of metallic chromium and hydrated chromium oxide,

wherein the following relationships:

$2 \leqq X$ and

$5 \leqq X+Y \leqq 20$

are met provided that X represents the amount of metallic chromium in the third layer and Y represents the amount of hydrated chromium oxide in the third layer calculated as elemental chromium, both expressed in mg/m^2.

4,561,944

METHOD FOR PRODUCING SUPPORTS FOR LITHOGRAPHIC PRINTING PLATES

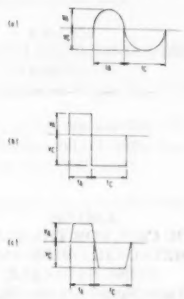
Hirokazu Sasaki; Akira Morita, and Takemasa Yamamoto, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd. and Nippon Light Metal Co., Ltd., both of, Japan

Filed Jun. 11, 1984, Ser. No. 619,425

Claims priority, application Japan, Jun. 9, 1983, 58-101791

Int. Cl.[4] C25D *5/44;* **C25F** *3/04*

U.S. Cl. 204—33 **5 Claims**



1. A method for producing a support for a lithographic printing plate which comprises mechanically graining the surface of an aluminum sheet, and then electrolytically graining the surface of the aluminum sheet in a solution containing hydrochloric acid, nitric acid, or a mixture thereof by applying thereto an unsymmetrical alternating current in such manner that the ratio of the quantity of electricity during the cathodic period to the quantity of electricity during the anodic period is in the range of from 1.0/1 to 2.5/1 and the quantity of electricity during the anodic period is 300 coulombs/dm^2 or less.

4,561,945

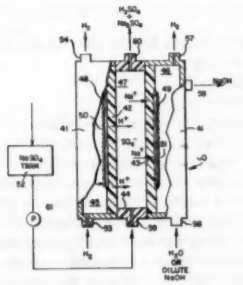
ELECTROLYSIS OF ALKALI METAL SALTS WITH HYDROGEN DEPOLARIZED ANODES

Thomas G. Coker, Lexington, and Anthony B. La Conti, Lynnfield, both of Mass., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 30, 1984, Ser. No. 635,976

Int. Cl.[4] C25B *1/16, 1/22, 1/02*

U.S. Cl. 204—98 **13 Claims**



1. A process for producing a caustic and an acid of an alkali metal salt comprising:

introducing an anolyte of an alkali metal salt solution into an anolyte chamber,

introducing hydrogen gas into the anolyte chamber,

causing the anolyte and the hydrogen gas to disassociate into alkali anions, alkali cations and hydrogen ions through the agency of an anode electrode thereby producing an acid,

introducing a catholyte into a cathode chamber,

disassociating the catholyte into hydrogen and hydroxyl ions through the agency of a cathode electrode,

transporting the alkali cations through a perm-selective membrane which is in intimate contact with one or more of the electrodes, to the cathode chamber, thereby producing an alkali metal hydroxide.

4,561,946

ELECTROLYTIC CELL FOR THE ELECTROLYSIS OF AN ALKALI METAL CHLORIDE AND PROCESS OF USING SAID CELL

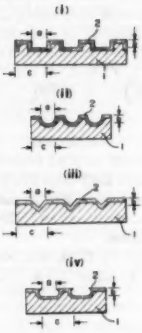
Manabu Suhara; Yasuo Sajima; Hiroaki Ito, and Kiyotaka Arai, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Aug. 6, 1984, Ser. No. 637,889

Claims priority, application Japan, Aug. 12, 1983, 58-146662

Int. Cl.[4] C25B *1/46, 13/02*

U.S. Cl. 204—98 **8 Claims**



1. An electrolytic cell for the electrolysis of an alkali metal chloride comprising:

an anode electrode,

a cathode electrode, and

an ion-exchange membrane therebetween; wherein said membrane is provided at least on one side thereof with a gas and liquid permeable non-electrocatalytic porous layer, whereby the porous layer completely covers the surface of at least one side of said membrane and is in contact with one of the electrodes; said ion-exchange membrane being provided on its porous layer surface with grooves which form continuous void spaces and secure passages for the electrolyte at the interface between the electrode and the ion-exchange membrane.

6. A method for electrolysing an aqueous solution of an alkali metal chloride comprising eletrolysing the solution in an electrolytic cell as claimed in claim **1**.

4,561,947

PROCESS FOR THE RECOVERY OF NOBLE METALS FROM ORES; WHICH PROCESS USES THIOUREA

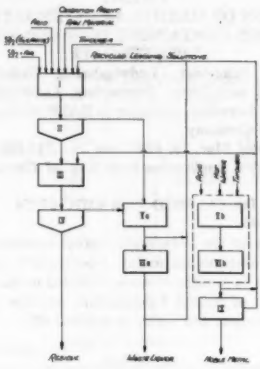
Reinhold Schulze, Hamburg, Fed. Rep. of Germany, assignor to SKW Trostberg Aktiengesellschaft, Trostberg, Fed. Rep. of Germany

Filed Feb. 9, 1984, Ser. No. 578,698

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1983, 3306130

Int. Cl.[4] C22B *11/04;* C25C *1/20*

U.S. Cl. 204—109 **5 Claims**



1. In a process for the hydrometallurgical recovery of noble metals selected from the group consisting of gold and silver, from materials containing them, by treatment with thiourea in an aqueous, acidic medium in the presence of an oxidation agent, the improvement wherein the aqueous medium simultaneously contains an oxidation agent and a reduction agent and wherein there is maintained a redox potential of 250 to 650 mV against an Ag/AgCl electrode in said medium.

4,561,948

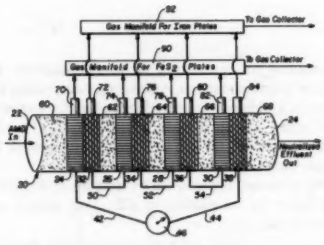
ELECTROCHEMICAL NEUTRALIZATION OF ACID ELECTROLYTE

Alfred H. Stiller, Morgantown, W. Va., assignor to West Virginia University, Morgantown, W. Va.

Filed Oct. 29, 1984, Ser. No. 665,569

Int. Cl.[4] C25B *1/02*

U.S. Cl. 204—129 **18 Claims**



1. A process for raising the pH of an acid solution comprising

providing a vessel with an electrically connected anode and cathode with the cathode being of lesser electroactivity than said anode,

introducing an acid-containing electrolyte into said vessel,

establishing a voltage gradient between said anode and said

cathode by causing said electrolyte to interact chemically with said anode to effect an oxidation reaction,

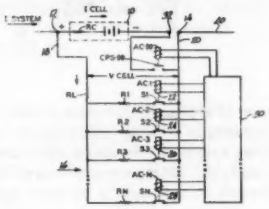
producing said voltage at a level which exceeds the overpotential for the formation of hydrogen, causing said cell to convert hydrogen ions to elemental hydrogen at said cathode, and withdrawing said electrolyte at a pH higher than the pH of the electrolyte when introduced into said vessel.

4,561,949

APPARATUS AND METHOD FOR PREVENTING ACTIVITY LOSS FROM ELECTRODES DURING SHUTDOWN

Ronald C. Miles, and David D. Justice, both of Cleveland, Tenn., assignors to Olin Corporation, Cheshire, Conn.

Filed Aug. 29, 1983, Ser. No. 526,936
Int. Cl.[4] C23F *13/00*
U.S. Cl. 204—147 **16 Claims**



14. A method for operating an electrolytic cell for the electrolysis of aqueous solutions containing ionizable compounds which comprises:

(a) feeding electric current to first conductor;

(b) closing a cell protection circuit connecting said first conductor and an anode;

(c) conducting current from said first conductor through said cell protection circuit to said anode;

(d) contacting said anode with said aqueous solution of an ionizable compound;

(e) passing electric current from said anode through said aqueous solutions to a cathode at a voltage substantially greater than the reversible potential to electrolyze said ionizable compound;

(f) separating said anode from said cathode with an ion exchange membrane;

(g) reducing said electric current to any suitable level down to that which is slightly above that employed at a reversible potential;

(h) opening said cell protection circuit; and

(i) discontinuing said electrolysis without maintaining a residual current.

4,561,950

POST-FORMABLE RADIATION-CURING COATINGS

A. Frank Leo, Palatine, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

Filed Apr. 2, 1984, Ser. No. 595,575
Int. Cl.[4] C08J *3/28*; C08L *33/08, 33/10*
U.S. Cl. 522—91 **6 Claims**

1. A radiation curable, post-formable liquid coating composition comprising:

(1) a silicone dicarbinol diurethane diacrylate or dimethacrylate based on a methyl or phenyl-substituted polysiloxane having a molecular weight of from 600 to 10,000, and in which the carbinol groups are carried by an ethoxylate constituting from 30% to 70% of the silicone dicarbinol;

(2) a linear dihydroxy-functional C_4–C_8 dicarboxylic acid-C_2–C_4 diol polyester diurethane diacrylate or dimethacrylate based on a polyester having an average molecular weight in the range of 600 to 2000;

(3) isobornyl acrylate or methacrylate; and

(4) acrylic or methacrylic acid;

said components 1 and 2 together providing from 30% to 50% of the composition, with component 2 being present in an amount of from 0% to 65% of the total of components 1 and 2, said component 3 being present in an amount of at least 30% of the composition and providing coating viscosity, and said component 4 being present in an amount of at least 3% of the composition.

4. A coating composition as recited in claim **1** in which acrylates are selected for all four components, and a photoinitiator is present to enable an ultraviolet cure.

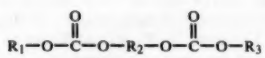
4,561,951

METHOD FOR POLYMERIZING A BIS(ALLYL CARBONATE)

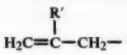
Douglas C. Neckers, 108 Secor Woods La., Perrysburg, Ohio 43551

Continuation-in-part of Ser. No. 444,750, Nov. 26, 1982, abandoned. This application Jul. 13, 1984, Ser. No. 630,705
Int. Cl.[4] C08F *2/46*
U.S. Cl. 522—33 **1 Claim**

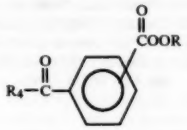
1. A method for polymerizing a bis(allyl carbonate) having the formula



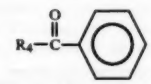
where R_1 and R_3 are allyl groups and R_2 is an alkylene chain, a di, tri- . . . or polyether, a mixed alkylene-ether/polyether chain or an aralkyl group having 2 aliphatic side chains, and R_1 and R_3 are represented by the formula



where R′ is hydrogen, halogen, or a 1 to 4 carbon alkyl group, said method comprising mixing the bis(allyl carbonate) and from 0.1 percent by weight to 30 percent by weight of a photoinitiator having the formula



where R is a C_1–C_{22} alkyl group; and R_4 is an organic group such that the moiety



is a light absorbing chromophore group which produces an excited state by light absorption and is selected from the group consisting of C_1–C_{22} alkyl groups, C_3–C_{22} cycloalkyl groups, C_6–C_{22} aryl groups, C_7–C_{22} aralkyl groups, C_7–C_{22} alkaryl groups, C_1–C_{22} alkoxy substituted aryl groups and morpholinyl, piperidyl, thiophenyl and furanyl heterocyclic groups, irradiating the bis(allyl carbonate) photoinitiator mixture with radiation at a wave length to which the photoinitiator is sensitive, and controlling the time of irradiation and the intensity of the radiation so that the bis(allyl carbonate) is polymerized.

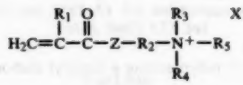
4,561,952
WATER REDUCIBLE QUATERNARY AMMONIUM SALT CONTAINING POLYMERS

Sherman J. Mels, Oak Forest; Brian C. Petrie, Chicago, and Richard J. Pokusa, Crestwood, all of Ill., assignors to The Sherwin-Williams Company, Cleveland, Ohio

Division of Ser. No. 431,995, Sep. 30, 1982, Pat. No. 4,444,955.
This application Mar. 16, 1984, Ser. No. 590,139
Int. Cl.[4] C25D *13/06*; C08L *75/08*
U.S. Cl. 204—181.7 19 Claims

1. The method of electrocoating an electrically conductive surface serving as a cathode by passing an electrical current through an electrical circuit comprising said cathode, an anode, and an aqueous electrodepositable composition in contact with said cathode and said anode; wherein the electrodepositable composition comprises:

(i) an acrylic polymer which comprises the free radical addition product of: (a) at least one quaternary ammonium salt containing unsaturated monomer having the structure:



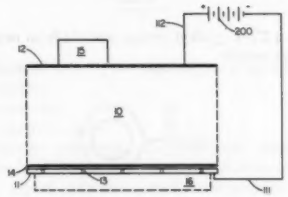
wherein R_1 is H or alkyl of 1 to 3 carbons; Z is N—H or O; R_2 is a divalent methylene radical $—(CH_2)_n—$ wherein n is from 1 to about 10; R_3, R_4 and R_5 can be the same or different and are alkyl, substituted alkyl, aryl or substituted aryl, with the proviso R_3, R_4 and R_5 cannot be hydroxy functional; and X^- is an anion; and (b) at least one active hydrogen functional unsaturated monomer; and (c) at least one other ethylenically unsaturated monomer; and

(ii) a blocked polyisocyanate which is stable in the presence of the acrylic polymer at room temperature but reactive with the acrylic polymer at elevated temperatures.

4,561,953
SOLID-LIQUID SEPARATION PROCESS FOR FINE PARTICLE SUSPENSIONS BY AN ELECTRIC AND ULTRASONIC FIELD

Harapanahalli Muralidhara, Dublin, Ohio; Bhupendra Parekh, Cypress, Tex., and Nagabhusan Senapati, Dublin, Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

Continuation of Ser. No. 504,780, Jun. 16, 1983, abandoned.
This application Jun. 20, 1984, Ser. No. 622,422
Int. Cl.[4] B01D *13/02*
U.S. Cl. 204—182.3 32 Claims



1. A method of dewatering a suspension comprising:

a. subjecting the suspension to an acoustical field at a frequency and amplitude adapted to cause separation in water bound to particles in the suspension;

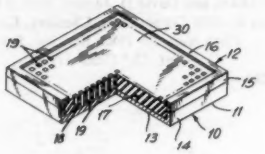
b. concurrently subjecting the suspension to an electrical field adapted to cause a migration of water and of particles resulting in a portion of the suspension having an increased concentration of particles and another portion having an increased concentration of water; and

c. removing water from the portion of the suspension having an increased concentration of water.

4,561,954
METHOD OF APPLYING TERMINATIONS TO CERAMIC BODIES

Dehart G. Scrantom, Sunset Beach, N.C., and Lonnie Hopkins, Colorado Springs, Colo., assignors to AVX Corporation, Great Neck, N.Y.

Filed Jan. 22, 1985, Ser. No. 693,173
Int. Cl.[4] C23C *15/00*
U.S. Cl. 204—192 R 5 Claims

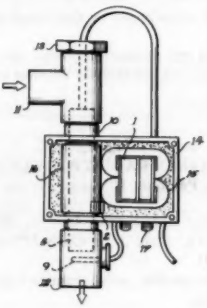


1. The method of applying conductive coatings to opposite ends of a multiplicity of ceramic bodies which comprises the steps of providing a resilient elastomeric mask having opposed parallel faces, said mask having a multiplicity of throughgoing apertures extending perpendicularly between said faces, subjecting said opposed faces of said mask to a metal sputtering step to thereby cause a metallic coating to be formed over said opposed faces, introducing into said apertures of said coated mask a multiplicity of said ceramic bodies to thereby expose end regions of said bodies at opposite faces of said mask, areas of said bodies between said end regions being shielded by said mask, subjecting said filled mask to further metal sputtering steps to thereby deposit a metallic film on said end regions and on said firs applied coating of said mask and thereafter removing said ceramic bodies from said mask.

4,561,955
COOLING ELECTRICAL APPARATUS

Graham Jackson, 35 Liffey Place, Woronora, New South Wales 2232, Australia

Filed Jun. 29, 1984, Ser. No. 626,314
Int. Cl.[4] C25B *15/08*; C25D *21/02*
U.S. Cl. 204—229 14 Claims



1. Electrolytic apparatus comprising

an anode and a cathode,

power supply circuit means including a rectifier for converting AC current to DC current, said rectifier being electrically connected to said anode and said cathode for supplying DC current thereto,

means for exposing said anode and said cathode to an electrolyte,

a fluid passage,

pump means for circulating a portion of the electrolyte through said fluid passage, and

a heat conducting member disposed in heat exchange relationship with said rectifer and extending into said fluid passage, whereby said flowing electrolyte acts to cool said rectifier,

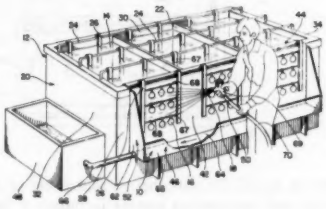
said heat-conducting member being a metal arm having means protecting its electrolyte-contacting surfaces from corrosion.

4,561,956

APPARATUS FOR RINSING ELECTROPLATING SOLUTION FROM ARTICLES

Christopher C. Antonelli, Smithfield, R.I., assignor to Antonelli Plating Co., Providence, R.I.

Filed May 29, 1984, Ser. No. 615,451
Int. Cl.[4] C25D *5/48, 21/08*
U.S. Cl. 204—232 4 Claims



1. An apparatus for rinsing electroplating solution from articles subsequent to the plating thereof comprising:

a. a splash wall having an upper edge and having an outwardly facing surface thereon;

b. means for supporting at least one of said articles in front of said splash wall surface;

c. an upwardly facing elongated trough attached to the lower end of said splash wall and extending longitudinally therealong and outwardly beneath said splash wall surface and beneath said article support means for receiving rinse solution and electroplating solution intermixed therewith when said article is supported on said article support means and said rinse solution is sprayed onto said article, said trough having an outer wall with an upper edge which is substantially beneath the upper edge of said splash wall;

d. means extending rearwardly from said splash wall for suspending said splash wall, said article support means and said trough from an upper edge of a wall of an electroplating tank so that said splash wall is disposed adjacent the outer surface of said tank wall and so that said trough is longitudinally inclined downwardly toward a lower end thereof; and

e. means communicating with said lower trough end for draining said rinse solution with electroplating solution intermixed therewith from said trough and for collecting same.

4,561,957

ELECTROLYTIC SILVER RECOVERY SYSTEM

James C. Palazzolo, 1815 Lakewood Dr., Salt Lake City, Utah 84117

Filed Jun. 11, 1984, Ser. No. 619,634
Int. Cl.[4] C25C *7/00*
U.S. Cl. 204—237 1 Claim

1. An electrolytic silver recovery unit for recovering silver from film fixer solutions and for returning desilver fixer solution to a film processing system comprising:

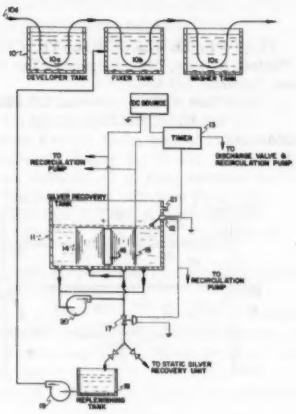
a tank for holding fixer solution from a film processing system from which silver is to be removed;

a removable cathode assembly sized to fit within said tank;

an anode assembly sized and shaped to cooperate electrolytically with said cathode assembly;

pump means to cause recirculation of the solution within the tank and to return desilvered fixer solution to said film processing system;

a liquid-level switch fixed to an inner wall of said tank which is activated to an on position by attainment of a predetermined upper solution level within the tank and deactivated to an off position by attainment of a predetermined lower solution level within the tank, said switch activating



said pump to recirculate solution within the tank and to activate a timer unit when said switch is activated to an on position and deactivating said pump and a discharge valve when said switch is deactivated to an off position;

a timer unit connected to said liquid level switch and activated thereby, said timer also connected to an electrode switch which controls electrical energization of the cathode and anode, said timer preset to control flow of electrical energy to said anode and cathode for a predetermined time period, said timer activating a discharge control valve;

discharge valve controlled drain means to drain desilvered solution from said tank, said drain valve being opened by timer at the conclusion of the preset time interval and closed by said liquid level switch being deactivated.

4,561,958

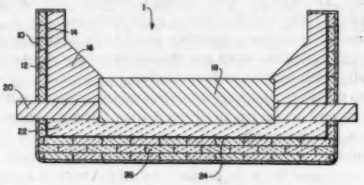
ALUMINA REDUCTION CELL

Douglas V. Stewart, Florence, and Alton T. Tabereaux, Sheffield, both of Ala., assignors to Reynolds Metals Company, Richmond, Va.

Filed Nov. 30, 1984, Ser. No. 677,088
Int. Cl.[4] C25C *3/00*
U.S. Cl. 204—243 R 19 Claims

1. In an alumina reduction cell comprising a steel outer shell, thermal insulation material on the floor and within said shell, a carbonaceous cathode on said thermal insulation material and carbonaceous sidewalls within said shell the improvement comprising a castable refractory vapor barrier layer interposed between said cathode and said thermal insulation material, said castable refractory vapor barrier layer comprising from about 75 to about 94.5 percent by weight of a refractory comprising from about 5 to about 10 percent by weight water, from about

45 to about 55 percent by weight alumina and from about 40 to about 50 percent weight silica, from about 0.5 to about 5 per-



cent by weight fibers and from about 5 to about 20 percent by weight filler.

4,561,959

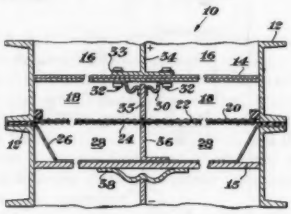
FLAT-PLATE ELECTROLYTIC CELL

John R. Pimlott, Sweeny, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 9, 1983, Ser. No. 559,660

Int. Cl.⁴ C25B *9/04, 11/03*

U.S. Cl. 204—253 **11 Claims**



1. In an electrolytic cell adapted to produce chlorine and an alkali metal hydroxide from an aqueous alkali metal chloride containing brine, the cell including at least two ion and liquid impermeable backplates with first and second surface portions partially defining at least two electrode compartments with substantially planar ion permeable electrodes within the electrode compartments spaced apart by, and contacting, a cation exchange membrane, the improvement comprising:

a plurality of expansible, electric conducting spring elements secured to the first surface portion of the backplate and to a rigid, electric conducting element secured to one electrode, and

a rigid, electric conducting pressure receiving means secured to a second electrode and to the second surface portion of the backplate facing the spring elements,

the spring elements cooperatively acting with the pressure receiving means to exert a force on the electrodes, and the membrane interposed between the electrodes, sufficient to retain the electrodes in close proximity with each other.

4,561,960

ARRANGEMENT FOR ELECTROLYTIC DEPOSITION OF CONDUCTIVE MATERIAL ON INTEGRATED CIRCUIT SUBSTRATES

Michel Jeannot, Neuchâtel, and Italo Salvalai, Peseux, both of Switzerland, assignors to Ebauches Electroniques SA, Marin, Switzerland

Filed Nov. 5, 1984, Ser. No. 668,242

Claims priority, application Switzerland, Dec. 1, 1983, 6430/83

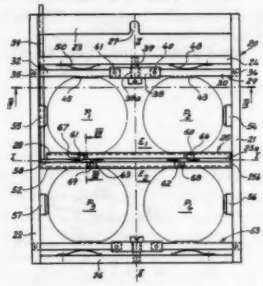
Int. Cl.⁴ C25D *17/06*

U.S. Cl. 204—297 W **20 Claims**

1. An arrangement for the electrolytic deposition of a conductive material on integrated circuit substrates each having a front face bearing an electrically conductive layer on which said material is to be deposited at least locally, a back and a substantially circular periphery, said arrangement being designed to be put into an electrolytic vat including anodes and fed by a direct current source located outside said vat, said arrangement comprising:

a frame work arranged to receive at least a first pair of integrated circuit substrates and including in the same plane two riser members and at least a first and a second runner member essentially parallel to one another and fastened at their ends to the riser members so as to be separated by a distance greater than the diameter of said substrates, said riser and runner members defining a space for receiving said substrates;

a mechanical system fixed to the framework for positioning and maintaining said substrates back-to-back and in



contact against one another in said plane of the framework, said mechanical system including a longitudinal groove formed in the second runner member and arranged to receive a first portion of the periphery of each substrate, and a mechanism positioned in said space on the side of the first runner member and including a groove substantially facing the groove of the second runner member and arranged to receive a second portion of each substrate diametrically opposed to said first portion, said mechanism including means for applying a force directed towards said second runner member to said second portions of the substrates; and,

an electrical system likewise fixed to the framework to enable coupling said electrically conductive layer of each substrate to said source.

4,561,961

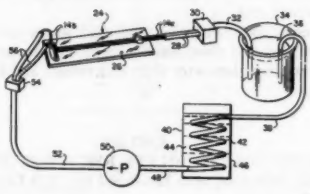
COOLED MICROSCOPE SLIDE AND ELECTRODE APPARATUS FOR USE IN LIVE CELL FUSION SYSTEM

Gunter A. Hofmann, San Diego, Calif., assignor to Biotronics, San Diego, Calif.

Filed Jul. 27, 1984, Ser. No. 634,974

Int. Cl.⁴ B01D *57/02*

U.S. Cl. 204—299 R **8 Claims**



1. An apparatus for use in a live cell fusion system, comprising:

a planar member;

a pair of hollow tubular electrodes extending spaced apart and parallel along an upper surface of the planar member for having a predetermined set of electric currents from the cell fusion system applied thereto;

means for securing the electrodes to the planar member; and

means for conveying a cooling fluid through the hollow electrodes to dissipate heat generated by applying the predetermined set of electric currents to the electrodes.

4,561,962

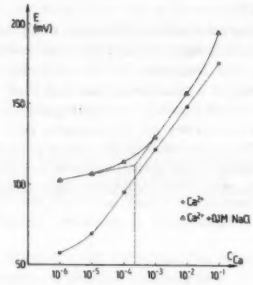
ION-SELECTIVE ELECTRODE AND PROCEDURE FOR MANUFACTURING SAME

Jouko Kankare, Turku, Finland, assignor to Fluilogic Systems Oy, Finland

Continuation of Ser. No. 482,549, Apr. 6, 1983, abandoned. This application Dec. 14, 1984, Ser. No. 674,720

Int. Cl.[4] G01N *27/30*

U.S. Cl. 204—415 **2 Claims**



1. An ion-selective electrode comprising a body wherein said body is formed from a member selected from the group of conductors and semiconductors and a membrane separating the body from a solution to be measured, said membrane consisting essentially of a crosslinked polymer material prepared by

(a) polymerizing a mixture comprised of allyloxy-substituted propylene glycol telomer and calcium bisdiallyl phosphate;

(b) removing ions from the polymerized material by equilibration with a solution of 10^{-3} molarity with respect to the ions to be removed said ions of the type to be selected by said electrode, to leave gaps conforming to said ions to be selected.

4,561,963

ANTIMONY AND GRAPHITE HYDROGEN ION ELECTRODE AND METHOD OF MAKING SUCH ELECTRODE

Jeffrey D. Owen, and Harold M. Brown, both of Salt Lake City, Utah, assignors to Zinetics Medical Technology Corporation, Salt Lake City, Utah

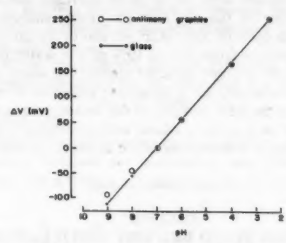
Filed Jul. 30, 1984, Ser. No. 635,755

Int. Cl.[4] G01N *27/30*

U.S. Cl. 204—433 **25 Claims**

1. An electrode for use in measuring hydrogen ion concentration comprising, a graphite core; an antimony/antimony oxide sensor secured in electrical contact with said graphite core and having an exposed surface for immersion in a test solution; and means for electrically isolating said graphite core and antimony/antimony oxide sensor junction from said test solution when said antimony/antimony oxide exposed surface is immersed therein.

19. A process for manufacturing an antimony and graphite hydrogen ion electrode comprising the steps of, connecting a section of graphite to an antimony/antimony oxide sensor so as to provide an internal reference junction; connecting that section of graphite to an electrical conductor; encasing said graphite and antimony/antimony oxide sensor junction and the electrical conductor in a liquid impervious sheath so as to leave



a portion of said sensor exposed; and connecting said electrical conductor to an electrically conductive lead.

4,561,964

CATALYST FOR THE HYDROCONVERSION OF CARBONACEOUS MATERIALS

Gopal H. Singhal; Karla S. Colle, both of Houston; Edward H. Edelson, Seabrook; Bobby L. Wilson, Missouri City, and Loan H. Dao, Houston, all of Tex., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Oct. 1, 1984, Ser. No. 655,787

Int. Cl.[4] C10G *1/06, 47/02, 47/04, 45/00*

U.S. Cl. 208—10 **27 Claims**

1. An improved process for hydroconverting carbonaceous materials comprising:

(a) forming a mixture of a carbonaceous material and a monohydrocarbyl substituted dithiocarbamate of a metal selected from Group VIII-A of the Periodic Table of the Elements;

(b) subjecting this mixture to hydroconversion conditions; and

(c) recovering a product from the conversion effluent.

4,561,965

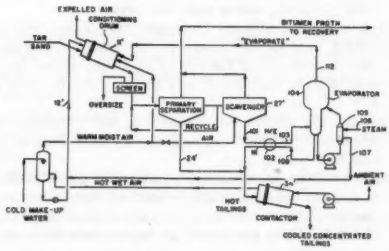
HEAT AND WATER RECOVERY FROM AQUEOUS WASTE STREAMS

Ari A. Minkkinen, Versailles, France, assignor to Lummus Crest Inc., Bloomfield, N.J.

Continuation of Ser. No. 92,908, Nov. 9, 1979, abandoned. This application Mar. 5, 1981, Ser. No. 240,734

Int. Cl.[4] C10G *1/00*

U.S. Cl. 208—11 LE **1 Claim**



1. In a process for the hot-water extraction of bitumen from tar sands wherein the tar sands are conditioned with hot water; the water-conditioned sands are treated in a primary separation zone to recover a bitumen stream, a middling stream, and a primary tar sands tailing stream; and the middling stream is treated in a scavenger separation zone to recover another

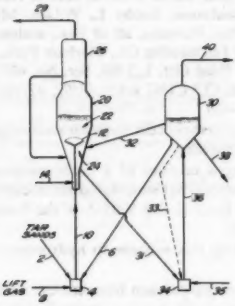
bitumen stream and a scavenger tar sands tailing stream, the improvement comprising contacting a waste stream comprising the primary tar sands tailing stream and the scavenger tar sands tailing stream with air to as to increase the heat and moisture content of the air, said air being employed in an amount of from 2000 to 5000 SCF per ton of tar sands tailings sufficient to recover from 2% to 10% of the water present in the hot tar sands tailings; directly contacting water with the heated and moisturized air to condense moisture from the air and to increase the heat content of the water, said water contacting said air as a spray coolant; and employing the heated water containing condensed moisture as make-up hot water in the process.

4,561,966

COMBINATION FLUID BED DRY DISTILLATION AND COKING PROCESS FOR OIL/TAR SANDS

Hartley Owen, Belle Mead; James H. Haddad, Princeton Jct., and John C. Zahner, Princeton, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 28, 1984, Ser. No. 655,272
Int. Cl.[4] C10G *1/00, 9/32*
U.S. Cl. 208—11 R **11 Claims**



1. A process for direct coking tar sands comprising:
contacting tar sand with heat transfer particles heated to a temperature of about 1200° F. obtained as defined below in a ratio of tar sand to heat transfer particles of from about 1 to 1 to about 1 to 5, in a contact zone at the lower end of a riser/mixer,
injecting a lift gas containing less than a sufficient amount of molecular oxygen to support combustion into said contact zone to fluidize, mix, and transport said tar sand and said heat transfer particles upwardly through said riser/mixer into an overhead fluid coking vessel positioned substantially vertically above said riser/mixer,
introducing the effluent from said riser/mixer into a first coking zone of said fluid coking vessel located substantially above and at the top of said riser/mixer, said first coking zone maintained at a temperature of from about 825° F. to about 950° F.,
moving said effluent downwardly in said overhead coking vessel into at least a second coking zone located below said first coking zone,
feeding at least one stream of heat transfer particles obtained as defined below into at least said second coking zone to maintain the temperature of said second zone at from about 50° F. to about 100° F. higher than the preceding coking zone,
recovering a stream of oil and light hydrocarbon gases liberated from said tar sand in said riser/mixer and said fluid coking vessel,
withdrawing stripped coked sands and heat transfer particle burden from said fluid coking vessel,
conveying said burden to a combustor, and
combusting said stripped coked sand to produce said heat transfer particles used to contact said tar sand and to maintain said elevated temperature in said at least second coking zone.

4,561,967

ONE-STEP STABILIZING AND DEWAXING OF LUBE OILS

Stephen J. Miller, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 256,622, Apr. 23, 1981, abandoned.
This application Dec. 15, 1983, Ser. No. 562,496
The portion of the term of this patent subsequent to Jan. 5, 1999, has been disclaimed.
Int. Cl.[4] C10G *11/05*
U.S. Cl. 208—120 **6 Claims**

1. A lubricating oil-stabilizing process, comprising:
catalytically stabilizing a hydrocracked lube oil feedstock by contacting said feedstock in the substantial absence of hydrogen and at a pressure of less than about 13 bar with a catalyst which contains no hydrogenation component and which comprises an intermediate pore size zeolite having a silica-to-alumina mole ratio of greater than about 200:1 and being in the hydrogen form, to produce a stabilized light neutral oil of good ultraviolet stability and good color.

4,561,968

CARBOMETALLIC OIL CONVERSION WITH ZEOLITE Y CONTAINING CATALYST

H. Wayne Beck, Russell, Ky.; James D. Carruthers, Fairfield, Conn.; Edward B. Cornelius, Ashland, Ky.; Ronald A. Kmecak, Ashland, Ky.; Stephen M. Kovach, Ashland, Ky., and William P. Hettinger, Jr., Russell, Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Division of Ser. No. 483,061, Apr. 7, 1983, Pat. No. 4,480,047.
This application Feb. 27, 1984, Ser. No. 568,326
Int. Cl.[4] C10G *11/05*
U.S. Cl. 208—120 **13 Claims**

6. A process for converting a hydrocarbon stream contaminated with carbon and metals, to lower molecular weight products, utilizing a low coke, high octane, high activity, high selectivity, metal tolerant, thermally and hydrothermally stable, low slurry oil producing catalyst, said catalyst comprising in combination:
(a) from about 8 to about 25% by weight of a zeolite comprising an HY zeolite, having a silica-alumina mole ratio of at least about 5, and having a cell dimension of about 24.30 to about 24.70 angstroms;
(b) from about 20 to about 70 wt.% of a clay comprising kaolin, having a size in spherical equivalents of from about 0.5 to about 2 microns;
(c) from about 35 to about 70% by weight of an acidic silica-alumina co-gel matrix comprising at least about 13 wt.% alumina;
(d) from about 0.1 to about 3 wt.% of rare earths comprising lanthanum and cerium in a ratio of from about 1 to about 6;
(e) wherein said zeolite is partially exchanged with said rare earths from a solution and wherein said zeolite is contained in an acidic matrix and wherein a portion of said rare earths has been precipitated into said matrix.

4,561,969

METHOD FOR REMOVING CHLORINE COMPOUNDS FROM HYDROCARBON MIXTURES

Edward J. Janoski, Havertown, Pa., and Elmer J. Hollstein, Wilmington, Del., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 28, 1984, Ser. No. 655,598
Int. Cl.[4] C10G *17/00*
U.S. Cl. 208—262 10 Claims

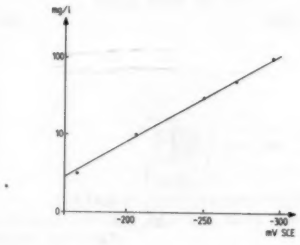
1. A process for removing halide ions from a hydrocarbon feedstream containing halogenated hydrocarbons comprising providing a hydrocarbon feedstock containing halogenated hydrocarbons, providing a solution of a suitable oxidizing acid containing a lanthanide salt, said oxidizing acid being present in a concentration of from about 50 weight percent to about 80 weight percent, said lanthanide salt being present in an amount sufficient to provide a substantially saturated solution of the oxidizing acid, and contacting the feedstock containing hydrogenated hydrocarbons with the acid solution containing the lanthanide salt for a time sufficient to remove substantially all of the halide ion from the hydrocarbon feedstock.

4,561,970

PROCESS FOR THE FROTH FLOTATION OF COMPLEX METAL COMPOUNDS

Seppo O. Heimala, Pori, and Kaarlo M. J. Saari, Vanha-Ulvila, both of Finland, assignors to Outokumpu Oy, Outokumpu, Finland

Filed Oct. 26, 1983, Ser. No. 545,510
Claims priority, application Finland, Nov. 2, 1982, 823737
Int. Cl.[4] B03B *1/00*
U.S. Cl. 209—3 8 Claims



1. A process for the froth flotation of an ore of complex metal compounds and metal compound powders from a mineral ore containing mixtures thereof, concentrating them out from an ore slurry, in which the electrochemical potential controlled, which comprises the steps of determining for each metal compound the electrochemical potential, pH, and temperature range within which the surface compound formed by the metal compound and the collector is stable adjusting the electrochemical potential by electrical, chemical or combined electrical and chemical means, to the froth flotation electrochemical potential within the said range from a direction in which the collector is completely in solution by using as the electrode the metal compound or metal compounds frothed in measuring for the control of the electrochemical potential of the slurry; and carrying out froth flotation on each metal compound in that order in which said potential ranges are in the cathodic to anodic electrochemical potential control direction, and controlling the concentration of the collector by continually measuring the solution electrochemical potential by an electrode selected from the class consisting of CuS_x, AgS_x and MoS_2 electrodes.

4,561,971

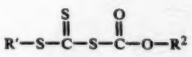
ORE FLOTATION AND FLOTATION AGENTS FOR USE THEREIN

Kenneth B. Kimble, and Clarence R. Bresson, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 458,505, Jan. 17, 1983, Pat. No. 4,528,141.
This application Oct. 24, 1984, Ser. No. 664,187
Int. Cl.[4] B03D *1/14*
U.S. Cl. 209—166 10 Claims

1. A process for recovering mineral sulfides comprising:

(a) mixing crushed ore containing said mineral sulfides, water, and a trithiocarbonate having the formula



wherein R′ is selected from the group consisting of alkyl and alkenyl radicals, and wherein R^2 is selected from the group consisting of alkyl and alkenyl radicals to establish a pulp;

(b) aerating said thus established pulp to produce a froth containing said mineral sulfides; and

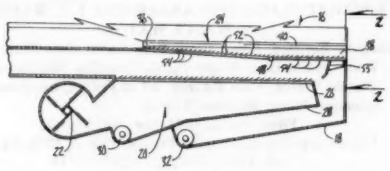
(c) recovering said mineral sulfides from said thus produced froth.

4,561,972

COMBINE SIEVE PLATE

Arthur L. Alm, Griswold, Iowa, assignor to Murry W. Schuler, Griswold, Iowa, a part interest

Filed Dec. 4, 1984, Ser. No. 677,857
Int. Cl.[4] B07B *1/00, 4/08*
U.S. Cl. 209—254 8 Claims



1. A substantially rectangular combine sieve, comprising:

a forward edge, a rearward discharge edge and opposite side edges, said forward edge and said side edges being in a substantially flat plane,

a tapered forward portion sloping downwardly and rearwardly from said forward edge to the substantial center of said sieve,

a substantially flat rearward portion extending from said forward portion to said rearward edge,

opposite side portions sloping downwardly from said side edges to said forward and rearward portions,

said sieve being adapted to receive grain adjacent said forward edge whereafter the downward slope of said forward and side portions and the taper of said forward portion provides a funneling action of said grain toward said rearward portion, said funneling action of said grain ceasing when said grain reaches said rearward portion such that a substantially shallow depth of said grain is maintained from said forward edge to said rearward edge.

4,561,973

ORE CONCENTRATOR PAD ASSEMBLY

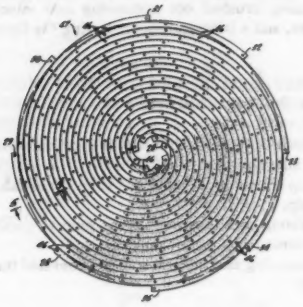
Keith B. Cleland, 4460 Park Newport, Newport Beach, Calif. 92660

Division of Ser. No. 323,171, Nov. 19, 1981, Pat. No. 4,476,014. This application Oct. 9, 1984, Ser. No. 659,235

The portion of the term of this patent subsequent to Oct. 9, 2001, has been disclaimed.

Int. Cl.[4] B03B *5/52*

U.S. Cl. 209—434 **6 Claims**



1. Concentrator pad assembly for such uses as the concentration of ores, said assembly comprising:

(a) a stretchable backing sheet,

(b) a plurality of strips of flexible material adhesively secured to said backing sheet and disposed in closely adjacent relationship to each other, and in volute relationship extending outwardly from a central opening in said backing sheet, said strips, when thus secured, defining teeth on the side thereof remote from said backing sheet, and

(c) said backing being stretchabie to conform to relatively rigid means to maintain said backing sheet and said strips in a selected configuration.

4,561,974

APPARATUS FOR THE ANAEROBIC FILTRATION OF WASTE WATER

Jacques Bernard, Saint German en Laye; Jean-Marie Rovel, Rueil Malmaison; Roger Nicol, Issy Les Moulineaux, and Claude Prevot, Ville d'Avray, all of France, assignors to Degremont, Hatus de Seine, France

Filed Feb. 2, 1984, Ser. No. 576,408

Claims priority, application France, Feb. 3, 1983, 83 01680

Int. Cl.[4] C02F *3/28;* **C12M** *1/18*

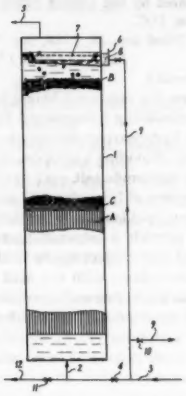
U.S. Cl. 210—151 **10 Claims**

1. In an apparatus for the anaerobic filtration of waste water, said apparatus being of the type including an enclosure having therein a submerged filter of filling material, means for introducing waste water to be treated into a lower portion of said enclosure such that said waste water passes through said filter from bottom to top and submerges said filter, during which biogas is produced, means for removing filtered water from an upper portion of said enclosure above said filter, and means for collecting said biogas above said filter, the improvement wherein said filter comprises:

a lower layer comprising an ordered arrangement of vertically extending members defining vertical channels through which passes the water being treated and having a large specific surface of up to 200 m^2/m^3;

an upper layer positioned above said lower layer and comprising a loosely packed arrangement of members having a specific surface greater than 200 m^2/m^3; and

means for supporting said upper layer and for separating said upper layer from said lower layer and comprising an intermediate layer of loosely packed hollow cylindrical bodies dimensioned or shaped to rest on said members of said lower layer without blocking said vertical channels and to prevent said members of said upper layer from penetrating downwardly into said members of said lower layer, each said cylindrical body having a diameter of at



least four times larger than the height thereof, said diameter of each said cylindrical body being at least 1.5 times the widths of said channels defined by said members of said lower layer.

4,561,975

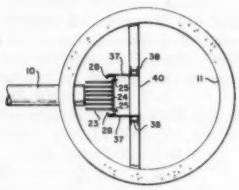
SELF-RELIEVING BAR SCREEN

Charles M. Schloss, Jr., 3198 Nome St., Aurora, Colo. 80010

Filed Feb. 22, 1983, Ser. No. 468,704

Int. Cl.[4] B01D *35/16*

U.S. Cl. 210—155 **23 Claims**



1. A self relieving bar screen in combination with an upright wall and an inflow conduit, said screen being positioned and arranged so as to intercept debris moved by a liquid through said conduit into a space defined by the wall a greater which has lateral dimension than that of the conduit, a discharge end of said conduit being operatively position in said wall which extends laterally to each side of said conduit the improvement comprising:

said self relieving bar screen comprising a series of bars disposed in spaced lateral relation in a position with respect to the conduit to form said space having a greater lateral dimension than that of the conduit; opposite the discharge end of said conduit, said wall also extending laterally to each side of said series of bars;

each said bar having a lower portion which extends to a position below the conduit and adjacent said wall and a rear, generally upwardly extending portion connected to the rear of said forwardly extending portion, said generally upwardly extending portion extending upwardly at or adjacent to a position generally opposite the top of said conduit; and

said series of bars extending laterally past each side of said conduit but for a distance less than the width of said wall,

whereby debris may accumulate on said bars but liquid may flow to each side of said bar screen into spaces defined by the lateral ends of said bar screen.

21. In a self-relieving screen is combination with an upright wall and a flow conduit, said screen being positioned and arranged so as to intercept debris moved by a liquid through said conduit into a space defined by the wall which has a greater lateral dimension than that of the conduit, a discharge end of said conduit being operatively positioned in said wall, the improvement comprising:

said self relieving screen being disposed in a spaced position respect to and opposite the discharge end of said conduit and having means for intercepting debris but permitting flow of liquid therethrough except when clogged by debris;

said wall having a lateral portion at each side of said conduit which extends laterally to each side of said screen;

said self relieving screen including lower intercepting means disposed below the conduit and extending laterally to opposite sides of the conduit;

said intercepting means also including rear intercepting means extending upwardly from the rear of said lower intercepting means and to one or more positions at preselected distances above said lower intercepting means;

said self relieving screen having a space at each side and said wall extending laterally to each side of said screen a distance sufficient to permit liquid to flow to each side of said self relieving screen when debris accumulates on said self relieving screen in sufficient amount to severely impede or prevent flow of liquid through said lower and rear intercepting means;

means for moving said screen to a position spaced from said discharge end of said conduit; and

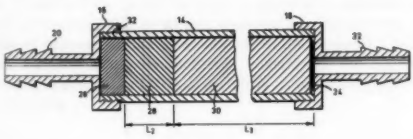
means for effecting a removal of collected debris from said screen at said position spaced from said discharge end of said conduit.

4,561,976

WATER PURIFICATION SYSTEM

Stan Houser, 288 Mill Rd., Suite E-45, Etobicoke, Ontario, Canada (M9C 4X7)

Filed May 15, 1984, Ser. No. 610,354
Int. Cl.⁴ B01D *25/06*
U.S. Cl. 210—290 **14 Claims**



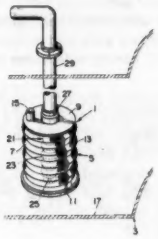
1. A filter device for removing organic contaminants from water comprising a filter housing having an inlet for water at one end and an outlet for water at an opposite end, a first layer of filter material comprising a hydrophobic, organophilic silicalite which is a crystalline silica molecular sieve capable of adsorbing molecules as large as benzene, a second layer of filter material comprising a type I, strong base anion exchange resin of high porosity and high capacity, and a third layer of filter material comprising activated carbon, said three layers being arranged in series in said housing.

4,561,977

CONTRACTIBLE FUEL FILTER DEVICE

Michiaki Sasaki, Hadano, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Mar. 8, 1984, Ser. No. 587,410
Claims priority, application Japan, Mar. 8, 1983, 58-37235
Int. Cl.⁴ B01D *35/02*
U.S. Cl. 210—356 **12 Claims**



1. A fuel filter device for use in a fuel tank comprising:

a filter body having a top portion, a bottom portion adapted to be placed on the bottom of the fuel tank, and a contractible filter portion fixed between the top and bottom portions; and

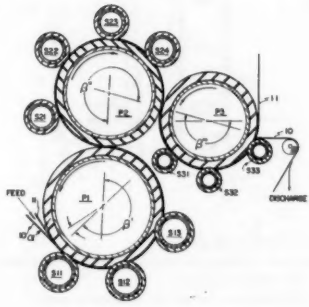
a fuel suction pipe having a contractible lower portion which is placed in the filter body and at least one fuel suction port formed in a lower end portion of the fuel suction pipe, said contractible filter portion and said contractible lower portion of the fuel suction pipe cooperating to absorb forces applied thereto.

4,561,978

MULTIPLE PRIMARY ROLL

Kenneth F. Janecek, Salt Lake City, Utah, assignor to Envirotech Corporation, Menlo Park, Calif.

Filed Oct. 9, 1984, Ser. No. 659,189
Int. Cl.⁴ B01D *33/02*
U.S. Cl. 210—401 **8 Claims**



1. A continuous dual-belt filter press for dewatering a filter cake comprising:

a first cylindrical primary roll having dewatering means;

at least one cylindrical first satellite roll in substantial surface contact with said first primary roll, said satellite roll having a diameter significantly smaller than said primary roll;

a pair of substantially parallel flat belts at least one of which is porous having substantial facial contact between said first primary roll and said satellite roll in contact therewith, the innermost of said belts maintaining substantial contact with the surface of said first primary roll for an arc

of substantially greater than about 120° of the cylindrical surface of said primary roll;

a second cylindrical primary roll having dewatering means, said second primary roll having a diameter smaller than said first primary roll, said second and first primary rolls being in substantial contact with one another with said second primary roll positioned with respect to the first point of contact with said belts with said first primary roll that said belts wrap said first primary roll for an arc of substantially more than 120°;

at least one cylindrical second satellite roll in substantial surface contact with said second primary roll, said second satellite roll having a diameter smaller than said first satellite roll;

a third cylindrical primary roll having dewatering means, said third primary roll having a diameter smaller than said second primary roll, said third primary roll being in substantial contact with said second primary roll and circumferentially displaced from the first point of contact with said belts with said second primary roll that said belts wrap said second primary roll for an arc substantially more than 120°.

4,561,979

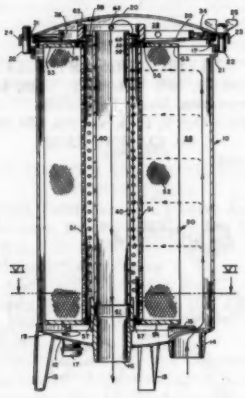
SINGLE CARTRIDGE FILTER

John F. Harms, North Palm Beach, and John F. Harms, II, West Palm Beach, both of Fla., assignors to Harmsco, Inc., North Palm Beach, Fla.

Continuation-in-part of Ser. No. 455,107, Jan. 3, 1983, abandoned. This application Aug. 29, 1984, Ser. No. 645,435

Int. Cl.⁴ B01D *27/06*

U.S. Cl. 210—438 **17 Claims**



1. In a filter comprising:

(A) a vertical cylindrical openable top vessel with a bottom wall, said vessel having:

(a) an inlet and an outlet in its bottom wall,

(b) a fastening means around its openable top,

(c) an internal vertical imperforate tube extending from said outlet to above the top edge of said vessel, and

(d) a sealing surface near the lower end of said vertical tube;

(B) a domed cover for said vessel having:

(a) means cooperating with said fastening means to attach said cover to said vessel; and

(C) a partition clampable between said top edge of said vessel and the edge of said cover, said partition having:

(a) a peripheral resilient seal for sealing said partition, said cover, and said vessel together,

(b) spacer means above said partition and engageable against the inside of said cover;

and the improvement comprising:

(c) means defining an aperture in said partition through which said vertical tube extends into said domed cover and which aperture is spaced from said vertical tube to form an annular opening in said partition, and

(D) a single replaceable pleated filter cartridge having:

(a) an internal perforate tube removable axially from around said vertical tube and spaced therefrom to form an annular cylindrical channel between said tubes the full length of said cartridge and aligned with said annular opening in said partition to force filtered liquid through said annular opening into said domed cover, and

(b) imperforate annular plastic end discs, the lower one of which annular plastic discs sealingly engages said sealing surface near the lower end of said vertical tube and the other of which annular plastic discs sealingly engages the underside of said partition,

whereby a fluid to be filtered is introduced into said inlet connection at the bottom of said vessel and around said filter cartridge, and filtered fluid passes through said internal perforated tube to around said internal imperforate vertical tube into said annular cylindrical channel, and up the outside of said imperforate tube into the domed cover above said partition and then down through the said internal imperforate vertical tube through said outlet at the bottom of said vessel.

13. In a filter cartridge comprising:

(a) an internal perforate tube,

(b) a pleated sheet filter medium surrounding said tube,

(c) annular resilient plastic discs embedding the ends of said filter medium and tube, said annular resilient plastic discs have a durometer hardness of between about 30D and about 80D according to ASTM Test Designation D2240-81,

and the improvement comprising:

(d) a more resilient plastic ring gasket integral and exposed outwardly from at least one of said annular plastic end discs, said more resilient plastic ring gaskets have a shore durometer hardness between about 30A and about 85A according to ASTM Test Designation D2240-81.

4,561,980

SCREENING DEVICE

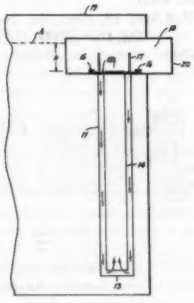
Raymond A. Couche, Dalkeith, Australia, assignor to R. A. Couche & Associates Pty. Ltd., Dalkeith, Australia

Filed Aug. 8, 1984, Ser. No. 638,760

Claims priority, application Australia, Aug. 8, 1983, PG0709

Int. Cl.⁴ B01D *39/00*

U.S. Cl. 210—486 **18 Claims**



1. A screening device for immersion in a vessel containing a pulp or slurry, said device comprising a screening chamber defined by a vertically extending screen closed at the top and bottom, said screen being located to be immersed in the pulp or slurry with the closed top positioned below the upper level of the pulp or slurry, an imperforate discarge pipe located within

and spaced from said screen of the screening chamber and having an open lower end and positioned close to but spaced from the bottom to permit flow into said discharge pipe from within said screening chamber and an upper end extending through and sealed relative to said closed top opening into a discharge outlet external to said vessel, said discharge outlet being located below the surface level of the pulp or slurry and above the level of the bottom of the chamber, the capacity of the discharge outlet and its spacing from the bottom being such as to maintain a flow rate through the screening chamber and discharge pipe to maintain the solids in the pulp or slurry passing through the screening device in suspension.

4,561,981
TREATMENT OF FOULING WITH MICROCAPSULES

William G. Characklis, 516 W. Cleveland, Bozeman, Mont. 59715

Filed Jan. 27, 1984, Ser. No. 574,455
Int. Cl.[4] C02F *5/08*
U.S. Cl. 210—696 **5 Claims**

1. A method for removing and/or inhibiting fouling deposited on an inner wall of a pipeline for transporting a fluid stream comprising the steps of:

selecting microcapsules, said microcapsules having a specific gravity greater than said fluid stream which have an anti-fouling material encapsulated therein;

the microcapsules being constructed of a semipermeable membrane material which slowly releases the anti-fouling material and which material adheres selectively to the fouling deposited on the inner wall of the pipeline and

introducing an effective amount of the microcapsules into the fluid stream;

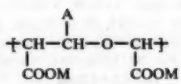
causing the microcapsules to adhere to the fouling deposited on the inner wall and slowly releasing the anti-fouling material to remove and/or inhibit fouling deposited on the inner wall.

4,561,982
SCALE INHIBITOR

Yasuhisa Kuriyama; Syoichiro Kajiwara, both of Tokyo, and Fumikazu Ozaki, Hiratsuka, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Oct. 19, 1983, Ser. No. 543,586
Claims priority, application Japan, Oct. 25, 1982, 57-187294
Int. Cl.[4] C02F *5/10*
U.S. Cl. 210—698 **5 Claims**

1. A method for inhibiting scale in water and aqueous systems, comprising adding to said water or aqueous systems an oxidized polysaccharide in an amount in the range of 1 to 20 ppm, wherein said polysaccharide contains as the essential structural units, at least 10% of carboxyl group-bearing units of the formula:



where A is CH_2OR, R is H, $(CH_2)_nCOOM$ or COOM, M is H, an alkali metal ion, or an ammonium group, n is a integer from 1 to 3, and said oxidized polysaccharide is obtained by the oxidative cleavage of a polysaccharide containing 6-membered monosaccharide rings having vicinal hydroxy groups with an oxidizing agent.

4,561,983
METHOD FOR CONTROLLING MOLLUSKS

Dwight P. Davis, Newtown, Pa., and Francis G. Doherty, Blacksburg, Va., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Aug. 7, 1984, Ser. No. 638,595
Int. Cl.[4] C02F *1/50*
U.S. Cl. 210—755 **14 Claims**

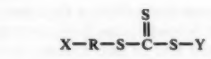
1. A method for controlling the fouling potential of mollusks in an aqueous system which comprises adding to said system an effective amount for the purpose of an effective nitrostyrene compound.

4,561,984
TRITHIOCARBONATE FLOTATION REAGENTS

Clarence R. Bresson; Robert M. Parlman, and James B. Kimble, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 328,340, Dec. 7, 1981, Pat. No. 4,459,237.
This application Mar. 23, 1984, Ser. No. 592,990
Int. Cl.[4] C09K *3/00*; C07C *154/00*; C22B *1/00*
U.S. Cl. 252—61 **8 Claims**

1. An ore flotation separation reagent containing a substituted hydrocarbyl trithiocarbonate of the formula



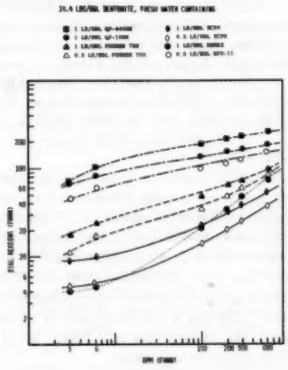
(I)

wherein X is selected from a —OH, —COOH, and —COOY; R is a $C_{1\text{-}20}$ hydrocarbylene moiety selected from the group consisting of alkylene and hydrocarbyl arylene; and Y is a Group IA metal ion, a Group IIA metal ion, or an ammonium ion, with the proviso that the amount of trithiocarbonate present in said reagent ranges from about 0.1 to 5 pounds per ton of ore concentrate being treated.

4,561,985
HEC-BENTONITE COMPATIBLE BLENDS

Joseph E. Glass, Jr., Fargo, N. Dak., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 28, 1982, Ser. No. 392,712
Int. Cl.[4] C09K *7/00*
U.S. Cl. 252—8.5 A **28 Claims**



1. A drilling fluid for use in the drilling of an oil well, gas well, geothermal well or the like, comprising:

(a) bentonitic clay or sub-bentonitic clay;

(b)

(1) a nonionic, water-soluble polysaccharide selected from the group consisting of (i) a nonionic, water-soluble

cellulosic derivative, (ii) a nonionic, water-soluble guar derivative; or

(2) an anionic water-soluble polysaccharide selected from the group consisting of (i) a carboxymethyl cellulose or (ii) Xanthomonas campestris polysaccharide; or

(3) a combination thereof;

(c) an intermediate molecular weight polyglycol, selected from the group consisting of polyethylene glycol, polypropylene glycol, and poly-(alkanediol), having an average molecular weight of from about 600 to about 30,000, said polyglycol being used in an amount effective to provide compatibility in the drilling fluid between the clay and the polysaccharide; and

(d) water, the drilling fluid being effective even in a highly saline environment.

4,561,986

COMBINED DISPERSANT FLUID LOSS CONTROL ADDITIVES

José L. Villa, 50 Claire Dr., Bridgewater, N.J. 08807, and Ronald N. Zeiner, 30 James St., Dover, N.J. 07801

Filed Jul. 19, 1984, Ser. No. 632,284

Int. Cl.[4] C09K *7/02*

U.S. Cl. 252—8.5 A **12 Claims**

1. An aqueous clay containing drilling fluid having present in an amount sufficient to control the rheology of the drilling fluid and to reduce fluid loss of said drilling fluid, a water soluble polymer composition of (1) from about 75% to about 85% by weight of polyacrylic acid having a weight average molecular weight of between about 3,500 to about 4,500 and (2) from about 15% to about 25% by weight of the copolymer of itaconic acid and acrylamide having a weight average molecular weight of between about 20,000 to about 40,000, there being from about 40% to about 50% by weight of itaconic acid and from about 50% to about 60% by weight of acrylamide in said copolymer, said water soluble polymer composition having a weight average molecular weight of between about 5,000 to about 15,000 in its partially or completely neutralized salt form.

4,561,987

LUBRICATING AGENTS FOR PROCESSING SYNTHETIC YARNS AND METHOD OF PROCESSING SYNTHETIC YARNS THEREWITH

Hisao Yamamoto, Aichi; Fumihiko Kimura, Gamagouri, and Osamu Ogiso, Aichi, all of Japan, assignors to Takemoto Yushi Kabushiki Kaisha, Aichi, Japan

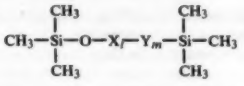
Filed Aug. 13, 1984, Ser. No. 639,852

Claims priority, application Japan, Oct. 6, 1983, 58-187627; Jan. 13, 1984, 59-5231; Jan. 14, 1984, 59-5199

Int. Cl.[4] D06M *11/00*

U.S. Cl. 252—8.9 **8 Claims**

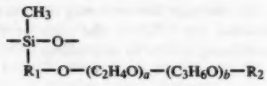
1. A lubricating agent for processing synthetic yarns, said lubricating agent comprising a lubricant as base oil thereof, said lubricant having as principal constituent thereof 82% to 99.45 weight percent of a polyether compound derived from alkylene oxide with 2 to 4 carbon atoms, 0.05 to 10 weight % of polyalkylene oxide modified polysiloxane which is shown by the general formula (I) and has average molecular weight greater than 2500 and 0.5 to 8 weight % of anionic surface active agent, the weight percent being based on the total weight of the three components.



(I)

where X is

l is an integer from 20 to 100, Y is



m is an integer from 1 to 9, R_1 is alkylene group with 3 to 4 carbon atoms, R_2 is hydrogen, alkyl group with 1 to 8 carbon atoms or acyl group with 2 to 8 carbon atoms, a and b are integers satisfying $15 \leqq a+b \leqq 80$ and $2/8 \leqq b/a \leqq 8/2$, and the repetition of X and Y and the repetition of (C_2H_4O) and (C_3H_6O) in Y may be either block or random repetition.

4,561,988

PROCESS FOR PRODUCTION OF PLATE-LIKE BARIUM FERRITE PARTICLES FOR MAGNETIC RECORDING

Norimichi Nagai; Nanao Horiishi, both of Hiroshima; Masao Kiyama, and Toshio Takada, both of Kyoto, all of Japan, assignors to Toda Kogyo Corporation, Hiroshima, Japan

Filed Oct. 30, 1984, Ser. No. 666,337

Claims priority, application Japan, Oct. 31, 1983, 58-204317

Int. Cl.[4] C04B *35/26*

U.S. Cl. 252—62.59 **3 Claims**

1. A process for production of plate-like barium ferrite particles represented by the formula (I):

$$BaFe_{12-x-y}M_xTi_yO_{19} \quad (I)$$

wherein x and y are respectively 0.3 to 1.2 and M is a divalent metal selected from the group consisting of Co, Ni, Zn and Mn for magnetic recording, free of α-Fe_2O_3 exhibiting a magnetization of larger than 35 emu/gram in a magnetic field of 10 KOe and a coercive field of 500–1000 Oe, which comprises forming an aqueous highly alkaline suspension of particles represented by the formula: $Fe_{12-x-y}M_xTi_yO_{16}$, wherein x, y and M are respectively the same as defined above, having a spinel crystalline structure and an average particle size of less than 0.1 μm and Ba ions where the atomic ratio of Ba to the total amount of the metals in said particles of spinel crystalline structure is in the range of from 1:8 to 1:10 and autoclaving said suspension at a temperature in the range from 250°–330° C. to form said plate-like barium ferrite particles.

4,561,989

HEAT STORAGE MATERIAL

Takahiro Wada, Katano; Ryoichi Yamamoto, Neyagawa, and Fumiko Yokotani, Ibaraki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jul. 30, 1984, Ser. No. 635,578

Int. Cl.[4] C09K *5/06*

U.S. Cl. 252—70 **2 Claims**

1. A heat storage material comprising a sodium acetate-water system containing at least 53–69% by weight sodium acetate (CH_3CO_2Na), wherein said heat storage material is mixed with a thickener comprising polyvinyl alcohol, paraffin and one or two components selected from the group consisting of formaldehyde and acetone.

4,561,990

HIGH LEAD SOLDER CORROSION INHIBITORS

Jerome W. Darden, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Oct. 4, 1984, Ser. No. 657,564
Int. Cl.[4] C09K 5/00
U.S. Cl. 252—75 6 Claims

3. A corrosion-protected antifreeze composition comprising

a. a glycol component selected from the group consisting of an alkylene glycol, an alkylene glycol ether and mixtures thereof, and

b. a corrosion-preventing mixture comprising

(1) a dicarboxylic acid component selected from the group consisting of at least one dicarboxylic acid comprising 8 to 12 carbon atoms and at least one alkali metal salt of a dicarboxylic acid comprising 8 to 12 carbon atoms, and

(2) at least one alkali metal molybdate in a weight ratio of dicarboxylic acid component to alkali metal molybdate of about 2:1.

4,561,991

FABRIC CLEANING COMPOSITIONS FOR CLAY-BASED STAINS

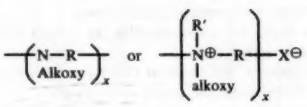
Ivan Herbots, Wetteren; James P. Johnston, Overijse, and John R. Walker, Waterloo, all of Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 6, 1984, Ser. No. 638,097
Int. Cl.[4] C11D 9/30, 15/04; C11B 11/00; D01C 3/00
U.S. Cl. 252—118 11 Claims

1. A stain removal composition, comprising:

a. a grease-removal organic solvent; and

b. an alkoxylated polyamine of the formula:



wherein R is hydrocarbyl having from 2 to 6 carbon atoms, R' is C_1 to C_{20} hydrocarbon, alkoxy is selected from polyethoxy, polypropoxy, polybutoxy or mixtures thereof, having a degree of polymerization of 2–30, x is an integer of at least 2 and X^{θ} is an anion wherein the weight ratio of the solvent:alkoxylated polyamine is in the range of 100:1 to 1:20.

4,561,992

AEROSOL CLEANING AGENT FOR TEXTILE SURFACES

Wolfgang Tröger, Pulheim; Otto Mesmer, and Renate Friedrichs, both of Wuppertal, all of Fed. Rep. of Germany, assignors to Vorwerk & Co. Interholding GmbH, Wuppertal, Fed. Rep. of Germany

Filed Jan. 27, 1983, Ser. No. 461,366
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1982, 3206146
Int. Cl.[4] C11D 3/12, 3/26
U.S. Cl. 252—155 16 Claims

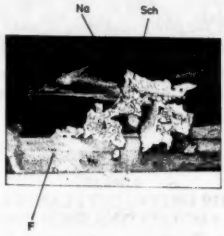
1. An aerosol cleaning agent for textile surfaces, particularly for the cleaning of textile upholstery, comprising

a propellant, and

approximately 65 to 75 wt% of an active substance comprising:

suspended sodium aluminum silicate particles which are buffered by acid to a pH range of about 7–8;

a plasticized urea-formaldehyde resin foam having open-cell foam particles in particle sizes between limit values of about 0.005 and 0.120 mm and with a density (in dry non-comminuted condition) of about 50 plus or minus 10 kg/m^3, said open-cell urea-formaldehyde resin foam particles perform a carrier transport function for said sodium aluminum silicate particles producing a piggy-back effect.

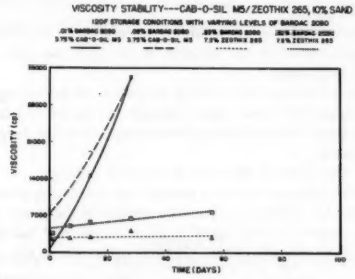


4,561,993

THIXOTROPIC ACID-ABRASIVE CLEANER

Clement K. Choy, Walnut Creek, and Barry A. Sudbury, Pleasanton, both of Calif., assignors to The Clorox Company, Oakland, Calif.

Continuation-in-part of Ser. No. 408,524, Aug. 16, 1982, abandoned. This application Mar. 16, 1984, Ser. No. 590,120
Int. Cl.[4] C11D 3/12
U.S. Cl. 252—174.25 17 Claims


VISCOSITY STABILITY----CAB-O-SIL M5/ZEOTHIX 265, 10% SAND
120F STORAGE CONDITIONS WITH VARYING LEVELS OF BARDAC 2080
VISCOSITY (cp)
TIME (DAYS)

1. A homogenous, thixotropic hard surface cleaner comprising about 0.05 to 2.5% of a cationic, nonionic, zwitterionic, or amphoteric surfactant, or mixtures thereof capable of hydrogen bonding, 6, to about 12% of a precipitated silica suspending agent, about 0.05 to 20% of an acid, an abrasive, and the remainder, water; wherein said cleaner stably suspends the abrasive while displaying minimal syneresis.

4,561,994

SURFACTANT FREE STABLE HYPOCHLORITE PASTE

Fred K. Rubin, Leonia; David V. Blarcom, West Milford, and Daniel J. Fox, Hawthorne, all of N.J., assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 284,292, Jul. 17, 1981, abandoned. This application Jul. 30, 1984, Ser. No. 635,981
Int. Cl.[4] C01B 11/00; C11D 7/54
U.S. Cl. 252—187.23 3 Claims

1. A stable aqueous, readily dispersible in hot or cold water hypochlorite paste composition having a viscosity of about 25,000 CPS to about 2,000,000 CPS, consisting essentially of in percent by weight of said composition:

(a) inorganic thickeners selected from the group consisting of about 55% zinc oxide, about 50% to about 55% titanium dioxide and about 50% to about 58% magnesium oxide;

(b) about 5% to about 85% of an aqueous sodium hypochlorite solution having from about 4.0 to about 14% available chlorine; and

(c) optionally a sufficient amount of an alkaline agent selected from the group consisting of alkali or alkaline earth metal hydroxides whereby the pH of said paste is brought to a value of greater than about 12.0.

4,561,995

MATERIAL FOR DRYING CUT PLANTS AND METHODS OF FACILITATING SUCH DRYING

George S. Fenn, Elkton, Oreg., assignor to Fenn & Company, Cottage Grove, Oreg.

Filed Apr. 5, 1982, Ser. No. 363,784

The portion of the term of this patent subsequent to May 15, 2001, has been disclaimed.

Int. Cl.⁴ C09K *3/00, 15/02, 15/32;* **A23L** *3/03*

U.S. Cl. 252—194 **35 Claims**

15. A material for use in a solution for drying cut plants, the material consisting of:

a first drying agent having properties of providing a basic pH and a colloidal suspension in an aqueous solution, and

a second drying agent having properties of providing a basic pH and a buffering action with the first drying agent in the solution to limit the pH of the solution to a particular value and of cooperating with the first drying agent to provide a protective coating on the plants when applied to the plants,

a surface active agent having properties of facilitating the penetration of the solution in the space occupied by the leaves, and

waterproofing agent having properties of providing for the passage of water vapor between the leaves and the atmosphere while inhibiting the passage of water drops to the leaves.

16. The material set forth in claim **15** wherein

the first drying agent is a metasilicate and has approximately one (1) to three (3) parts by weight in the material and

the second drying agent is a carbonate and has approximately five (5) to two (2) parts by weight in the material.

4,561,996

ELECTRICAL RESISTOR AND METHOD OF MAKING THE SAME

Curtis L. Holmes, Elkhart, Ind.; William M. Faber, Sr., Plano, Tex.; Gaylord L. Francis, Morristown, N.J., and Otis F. Boykin, Chicago, Ill., assignors to CTS Corporation, Elkhart, Ind.

Continuation of Ser. No. 839,756, Oct. 5, 1977, Pat. No. 4,267,074, which is a continuation of Ser. No. 506,449, Oct. 24, 1965, Pat. No. 4,418,009, which is a continuation of Ser. No. 169,355, Jan. 29, 1962, abandoned. This application Feb. 9, 1981, Ser. No. 232,840

Int. Cl.⁴ H01B *1/00*

U.S. Cl. 252—514 **12 Claims**

1. A resistor composition comprising a mixture of a finely divided glass, at least 0.2 percent by weight of the total composition of a finely divided oxide of a noble metal selected from the group consisting of iridium oxide and ruthenium oxide, and 30 percent to 70 percent by weight of the total composition of a finely divided refractory filler oxide, the ratio of the glass to the refractory filler oxide being such that the composition may be formed into a desired shape and fired at a temperature sufficiently high to fuse the glass without changing the shape.

4,561,997

PROCESS FOR THE PREPARATION OF AIR-REFRESHING GELS AS WELL AS THE OBTAINED GELS

Ernst-Ludwig Roehl, Naarden, Netherlands, assignor to Naarden International N.V., Netherlands

Filed Aug. 16, 1983, Ser. No. 523,750

Claims priority, application Netherlands, Aug. 20, 1982, 8203275

Int. Cl.⁴ A01K *7/46*

U.S. Cl. 252—522 A **5 Claims**

1. A process for the preparation of aqueous air-freshener gels containing a perfume characterized by homogeneously mixing the perfume with one or more solid inorganic carrier materials selected from the group consisting of magnesium oxide powder, active carbon, zeolites and absorption agents based on silica and then combining the homogeneous mixture obtained in this way with an aqueous gel or the gel forming components, said perfume having been previously mixed homogeneously with a non-ionogenic emulsifier in an amount of 5–200% calculated on the weight of the perfume, when zeolites or absorption agents based on silica are used.

4,561,998

NEAR-NEUTRAL PH DETERGENTS CONTAINING ANIONIC SURFACTANT, COSURFACTANT AND FATTY ACID

Jean-Luc H. M. Wertz, Ceroux-Mousty, Belgium, and Pierre C. E. Goffinet, Bruxelles, France, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 380,988, May 24, 1982, abandoned. This application Jul. 26, 1984, Ser. No. 634,188

Int. Cl.⁴ C11D *1/8, 1/04*

U.S. Cl. 252—547 **13 Claims**

1. A detergent composition comprising:

(a) from about 2% to about 60% by weight of an anionic synthetic surfactant;

(b) from about 0.25% to about 12% by weight of a cosurfactant selected from the group consisting of:

(i) quarternary ammonium surfactants having the formula:

$$[R^2(OR^3)_y][R^4(OR^3)_y]_2R^5N^+X^-$$

wherein R^2 is an alkyl or alkyl benzyl group having from about 8 to about 18 carbon atoms in the alkyl chain; each R^3 is selected from the group consisting of $-CH_2CH_2-$, $-CH_2CH(CH_3)-$, $-CH_2CH(CH_2OH)-$, $-CH_2CH_2CH_2-$, and mixtures thereof; each R^4 selected from the group consisting of C_{1-4} alkyl, C_{1-4} hydroxyalkyl, benzyl, and hydrogen when y is not 0; R^5 is the same as R^4 or is an alkyl chain wherein the total number of carbon atoms of R^2 plus R^5 is not more than about 18; each y is from 0 to about 10 and the sum of the y values is from 0 to about 15; and X is any compatible anion; and

(ii) diquaternary ammonium surfactants having the formula:

$$[R^2(OR^3)_y][R^4(OR^3)_y]_2N^+R^3N^+R^5[R^4(OR^3)_y]_2(X^-)_2$$

wherein R^2, R^3, R^4, y and x are as defined above;

(c) from about 5% to about 40% by weight of a fatty acid containing from about 10 to about 22 carbon atoms; and

(d) from about 3% to about 10% by weight of a detergent builder;

said composition having a molar ratio of the anionic synthetic surfactant to the cosurfactant of at least 1 and formulated to provide an initial pH of from about 6.0 to about 8.5 at a concentration of from about 0.1% to about 2% by weight in water at 20° C.

4,561,999

SURFACTANT COMPOSITION

Shizuo Sekiguchi, Funabashi; Kyozo Kitano, Narashino, and Katsumasa Nagano, Ichikawa, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed May 10, 1984, Ser. No. 608,680

Claims priority, application Japan, May 10, 1983, 58-081569

Int. Cl.[4] C11D *1/12, 1/28*

U.S. Cl. 252—557 4 Claims

1. A surfactant composition consisting essentially of:

(A) a sulfonic acid salt of a lower alkyl ester of a C_8 to C_{22} saturated fatty acid; and

(B) a sulfonic acid salt of a lower alkyl ester of a C_8 to C_{22} unsaturated fatty acid,

wherein the weight ratio (A/B) of the component (A) to the component (B) is 80/20 to 20/80.

4,562,000

PROCESS FOR THE SEPARATION OF KRYPTON FROM A RADIOACTIVE WASTE GAS MIXTURE AND ARRANGEMENT FOR IMPLEMENTING THE PROCESS

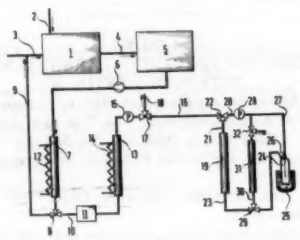
Helmut Ringel, Niederzier-Hambach, Fed. Rep. of Germany, assignor to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Fed. Rep. of Germany

Filed Apr. 12, 1983, Ser. No. 484,245

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1982, 3214825

Int. Cl.[4] G21F *9/02*

U.S. Cl. 252—630 11 Claims



1. In a process for the separation of krypton from a radioactive waste gas mixture wherein burned-down nuclear fuel particles are released during chemical dissolution, the waste gas mixture containing krypton, xenon, nitrous oxide and residual gas components including aerosols, iodine, tritium and carbon (C-14) dioxide, said process comprising:

combining said waste gas mixture with a carrier gas in a resolver;

partially purifying said waste gas mixture from nitrous oxide, aerosols and iodine in a purification zone;

reconveying a first portion of said partially purified waste gas mixture into the resolver to be recycled within said process;

further purifying a second and remaining portion of said partially purified waste gas mixture of tritium and carbon (C-14) dioxide;

removing xenon from the second portion of said waste gase mixture;

discontinuously separating krypton from the second portion of said waste gas mixture in a preparative gas chromatograph; and

storing said separated krypton;

whereby the reconveying of a portion of said partially purified waste gas mixture into the resolver after the waste gas has been purified of nitrous oxide, aerosols and iodine provides an enrichment of the krypton in the reconveyed waste gas mixture to facilitate the separation of said krypton when said reconveyed waste gas mixture is recycled through said process.

4,562,001

MULTIPLE LAYERED TRANSPORTATION AND STORAGE CONTAINER FOR RADIOACTIVE WASTES

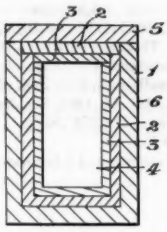
Horst Vietzke, Maintal; Elmar Schlich, Gründau; Günther Luthardt, Rodenbach, and Hans Huschka, Hanau, all of Fed. Rep. of Germany, assignors to Nukem GmbH, Hanau, Fed. Rep. of Germany

Filed Feb. 2, 1982, Ser. No. 344,962

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1981, 3103526

Int. Cl.[4] G21F *1/08*

U.S. Cl. 252—633 18 Claims



1. A multi-layered transportation and storage container for the long time storage of radioactive waste, especially fuel elements, in suitable geological formation consisting essentially of a container having at least three layers of different metals or metal alloys, said layers being increasingly noble in the electromotive series from the outermost layer inwardly.

4,562,002

HOMOGENEOUS AQUEOUS FABRIC SOFTENING COMPOSITION WITH STILBENE SULFONIC ACID FLUORESCENT WHITENER

Oscar W. Neiditch, Fair Lawn; Edmund S. Hurdle, North Bergen, and Daniel J. Fox, Hawthorne, all of N.J., assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 486,624, Apr. 20, 1983, Pat. No. 4,497,718. This application Nov. 5, 1984, Ser. No. 668,363

The portion of the term of this patent subsequent to Feb. 5, 2002, has been disclaimed.

Int. Cl.[4] D06L *3/12;* D06M *13/38, 13/46*

U.S. Cl. 252—8.75 13 Claims

1. A fabric softening and whitening composition prepared by a method comprising:

(a) preparing an organic premix of:

(i) from about 0.5% to about 10% fabric softening cationic surfactant;

(ii) from about 0.001% to about 0.3% stilbene sulfonic acid fluorescent whitening agent added in acid form;

(iii) from about 0.001% to about 0.5% of a non-ionizable base, the ratio of base to fluorescent whitening agent on an equivalent weight basis being about 1:1 to about 6:1;

(b) adding said premix to deionized water containing water-soluble adjunct fabric softening components including from 0.01% to 0.3% of an acidic pH adjusting agent to obtain a pH of 3.0 to 6.0; and

(c) mixing the combined blends with sufficient stirring to uniformly disperse all components.

4,562,003

MONOCLONAL ANTIBODIES AGAINST ALVEOLAR SURFACTANT PROTEIN

John Lewicki, Sunnyvale, Calif., assignor to California Biotechnology, Inc., Mountain View, Calif.

Filed Oct. 26, 1984, Ser. No. 665,018

Int. Cl.[4] A61K *39/395;* **C12N** *5/00;* **C12P** *21/00;* **C12Q** *1/00*

U.S. Cl. 260—112 B **23 Claims**

1. Monoclonal antibody (Mab) specific against human alveolar surfactant protein (ASP).

4,562,004

2,3,5,6-TETRASUBSTITUTED P-BENZOQUINONES AND THEIR PREPARATION

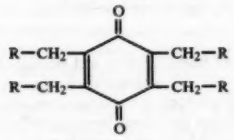
Gerd Steiner, Kirchheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 14, 1984, Ser. No. 588,973

Int. Cl.[4] C07C *50/06, 153/11*

U.S. Cl. 260—396 R **11 Claims**

1. A 2,3,5,6-tetrasubstituted p-benzoquinone of the formula I



where R is bromine, C_2–C_6-acylthio or benzoylthio.

4,562,005

2-METHOXYPROPYL PHOSPHATE DERIVATIVES

Shoshichi Nojima, Tokyo, and Hiroaki Nomura, Osaka, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

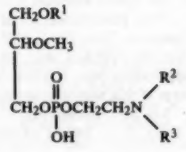
Filed Mar. 2, 1984, Ser. No. 585,415

Claims priority, application Japan, Apr. 4, 1983, 58-59833

Int. Cl.[4] A23J *7/00*

U.S. Cl. 260—403 **10 Claims**

1. A compound of the formula



wherein R^1 is an alkyl, alkenyl or alkynyl group of 15 to 20 carbon atoms, R^2 is an alkyl group of 1 to 4 carbon atoms and R^3 is a hydrogen atom or an alkyl group of 1 to 4 carbon atoms, or a pharmaceutically acceptable salt thereof.

4,562,006

CYCLOHEPTADIENE DERIVATIVES

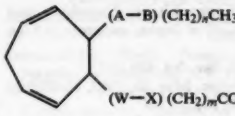
David T. Connor, and Roderick J. Sorenson, both of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jan. 11, 1984, Ser. No. 569,814

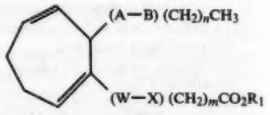
Int. Cl.[4] C07C *57/03;* **A61K** *31/215;* **C11C** *3/02*

U.S. Cl. 260—410 **12 Claims**

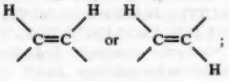
1. A compound of the formula



, or



in which (A-B), (C-D), (W-X), and (Y-Z) are each independently $(CH_2)_2$,



n and m are each independently integers one to ten; and R_1 is selected from hydrogen lower alkyl, lower alkenyl, phenyl, phenyl lower alkyl, and phenyl and phenyl lower alkyl substituted in the phenyl ring by halogen, lower alkyl, lower alkoxy, hydroxy, or trifluoromethyl, or a pharmaceutically acceptable base salt thereof.

4,562,007

PROCESS FOR PREPARING CARBOXYLIC ACID ESTERS OF HEXITOLS

Herbert Stühler, Burgkirchen, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 3, 1983, Ser. No. 548,286

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1982, 3240892

Int. Cl.[4] C09F *5/08, 7/10;* **C11C** *3/00*

U.S. Cl. 260—410.6 **4 Claims**

1. A process for preparing carboxylic acid esters of hexitols by reacting hexitols with carboxylic acids in the presence of alkaline catalysts and an inert gas atmosphere while stirring and while removing the water formed in the course of the esterification, which comprises

(a) using hexitol and carboxylic acid in a molar ratio of 1:0.5 to 1:2,

(b) using the alkaline catalyst in an amount of 0.1 to 0.5% by weight, relative to the amount of hexitol,

(c) heating up rapidly to a temperature of 220° to 240° C. and reacting at that temperature,

(d) continuing the reaction until an acid number of 4 to 10 has been reached, and

(e) cooling down rapidly to a temperature of 120° to 20° C. when this acid number has been reached.

4,562,008

HEAT CURABLE SOLVENTLESS LIQUID PREPOLYMER AND NOVEL MONOMER DERIVED FROM HEXYLCARBITOL FOR USE THEREWITH

Richard A. Markle, Columbus, Ohio, and Wayne R. Melchior, Plymouth, Mich., assignors to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Filed Jan. 21, 1983, Ser. No. 459,947

The portion of the term of this patent subsequent to Jul. 16, 2002, has been disclaimed.

Int. Cl.[4] C08F *8/00, 222/36;* **C07C** *121/00*

U.S. Cl. 260—465.4 **6 Claims**

1. A liquid heat curable prepolymer substantially free from solvents, and which can be compounded and cured at about 360° F. to form a cured product having a Shore A hardness of

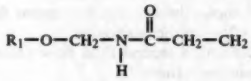
about 70 to about 89, tensile strength of about 410 to about 780 psi, percent elongation of about 120 to about 140, fuel resistance of about 49 to about 62, and a compression set of 20–30%,

said prepolymer being formed from the polymerization of

at least about 65% of a rubber formable monomer selected from the group consisting essentially of conjugated dienes, alkyl esters of acrylic acid and alkyl esters of methacrylic acid;

at least about 20% of a nitrile monomer selected from the group consisting of acrylonitrile and methacrylonitrile; and

at least about 4% of an acrylamide monomer



wherein R_1 represents C_3–C_{22} polar group substituted alkyl or unsubstituted alkyl, said polar group selected from the group consisting essentially of ether, aldehyde, ketone, amide, ester, imide, or phthalimide; in the presence of

an amount of a chain transfer agent effective to establish the weight average molecular weight of said prepolymer at less than about 25,000; and

whereby during the heat cure of said prepolymer said acrylamide monomer forms a compound R_1—OH;

wherein said compound R_1—OH has a boiling point greater than the cure temperature of said prepolymer.

4,562,009

HALONITRILES, THEIR PREPARATION AND USE TO MAKE HALOPYRIDINES

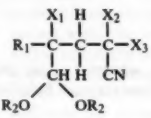
Zenon Lysenko, and R. Garth Pews, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 28, 1983, Ser. No. 555,789

Int. Cl.⁴ C07C *121/34, 119/02*

U.S. Cl. 260—465.6 **8 Claims**

1. A compound having the formula



wherein R_1 is H or alkyl; R_2 is alkyl or lowercycloalkyl; X_1 is Cl, Br or I; X_2 is X_1, H, alkyl or cycloalkyl, and X_3 is F, Cl or Br.

4,562,010

PROCESS FOR THE PREPARATION OF BENZOIC ANHYDRIDE

Karl Goliasch, Bergisch-Gladbach; Herbert Müller, Cologne, and Heinrich Pelster, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 223,969, Jan. 12, 1981, abandoned, which is a continuation of Ser. No. 65,822, Aug. 13, 1979, abandoned. This application Feb. 20, 1985, Ser. No. 703,373

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1978, 2837457

Int. Cl.⁴ C07C *51/56*

U.S. Cl. 260—546 **2 Claims**

1. A process for preparing benzoic anhydride which comprises contacting benzotrichloride with benzoic acid in a molar ratio of 1:2–3 at a temperature in the range of 100°–200° C., separating off from the reaction mixture benzoyl chloride formed as by-product, together with residual unreacted benzoic acid and/or residual unreacted benzotrichloride and adding them again to a starting reaction mixture, wherein the initial reaction of said benzotrichloride and benzoic acid is effected in the absence of an additive other than a solvent or an inert sweep gas.

4,562,011

PROCESS FOR PREPARING ARYL PHOSPHATES

Robert J. Axelrod, Glenmont, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Nov. 28, 1983, Ser. No. 555,720

Int. Cl.⁴ C07F *9/09*

U.S. Cl. 260—978 **15 Claims**

1. A process for preparing aryl phosphates, comprising reacting a diaryl carbonate with a compound selected from the group consisting of phosphoric acid, aryl phosphate and mixtures of both, in the presence of a source of hydrogen ions.

4,562,012

VARIABLE VENTURI TYPE CARBURETOR

Mitsuyoshi Teramura; Masatami Takimoto, both of Toyota; Norihiko Nakamura, Mishima; Takaaki Itoh, Mishima; Takashi Katou, Mishima, and Yukinori Isoya, Nagoya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Aisan Industry Co., Ltd., both of, Japan

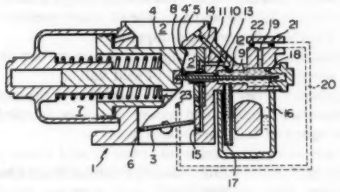
Division of Ser. No. 428,034, Sep. 29, 1982, Pat. No. 4,500,476. This application Sep. 5, 1984, Ser. No. 647,543

Claims priority, application Japan, Dec. 24, 1981, 56-207989

The portion of the term of this patent subsequent to Feb. 19, 2002, has been disclaimed.

Int. Cl.⁴ F02M *9/06*

U.S. Cl. 261—44 C **5 Claims**



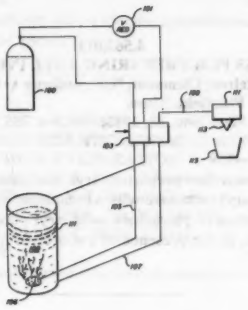
1. A variable-venturi-type carburetor having an intake passage therethrough; a suction piston movable in the intake passage; a substantially horizontally extending main fuel passage having a first end and a second blind end opposite to said first end; a metering jet arranged adjacent to the first end of said main fuel passage for interconnecting the main fuel passage to the intake passage; said main fuel passage having a first diameter portion and an enlarged second diameter portion, said portions formed between said metering jet and said second blind end with said first diameter portion being formed closer to said metering jet; a slow fuel passage having a fuel inlet which is open to the main fuel passage at said first diameter portion, said slow fuel passage having a fuel outlet which is open to the intake passage; a metering needle fixed onto the suction piston and extending into the metering jet for metering fuel fed into the intake passage from the main fuel passage; and a fuel vapor conduit havng a fuel vapor inlet which is open to the main fuel passage at said enlarged second diameter portion; said fuel vapor conduit having a fuel vapor outlet which is open to the intake passage.

4,562,013

CARBONATOR VALVE

Edward L. Jeans, Gwent, Wales, assignor to Cadbury Schweppes, PLC, London, United Kingdom

Filed Nov. 10, 1983, Ser. No. 550,454
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—50 B **10 Claims**



1. In a drink dispenser for dispensing carbonated drinks which includes a source of carbon dioxide at high pressure and a source of carbon dioxide at a lower pressure, said lower pressure being a pressure utilized for dispensing carbonated water, a method of quickly batch carbonating water within a carbonator tank having a head space comprising the steps of:

(a) admitting carbon dioxide to the carbonator tank at said higher pressure until a pressure intermediate said higher and lower pressure is reached in said head space; and

(b) venting the head space of the carbonator to said lower pressure.

4. In a drink dispenser for dispensing carbonated drinks including a batch carbonator with a sparger through which carbon dioxide may be admitted for carbonating still water within the carbonator, a head space being provided over the water in the carbonator, said system inciuding a source of high pressure carbon dioxide and a source of lower pressure carbon dioxide, a carbonating valve comprising:

(a) means, for coupling the higher pressure carbon dioxide to the sparger upon actuation of said valve;

(b) a pressure relief valve set to operate at a pressure intermediate said higher and lower pressures coupled to the head space of said carbonator; and

(c) means to couple said head space to said lower pressure when said carbonating valve is returned to an unactuated position after operation of said pressure relief valve thereof, whereby said head space will be vented to said lower pressure.

4,562,014

METHOD AND DEVICE FOR IN-LINE MASS DISPERSION TRANSFER OF A GAS FLOW INTO A LIQUID FLOW

Dennis E. J. Johnson, 1025 Garfield Ave., Aurora, Ill. 60506

Continuation-in-part of Ser. No. 450,365, Dec. 16, 1982, Pat. No. 4,491,551, which is a continuation-in-part of Ser. No. 325,817, Dec. 2, 1981, Pat. No. 4,382,866, which is a continuation-in-part of Ser. No. 213,829, Dec. 9, 1980, abandoned. This application Aug. 29, 1984, Ser. No. 645,400
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—64 R **15 Claims**

1. A device for effecting dispersion of a gas flow into a conduit conveyed liquid flow, said device comprising:

a T-fitting body having in-line liquid inflow and outflow ends and a mounting section intermediate said ends,

said body defining intermediate said ends thereof a fluid flow passage extending normally of said ends,

a standpipe mounted on said body at said section in fluid flow communicating relation to said body passage,

conduit means for making said standpipe subject to a source of gas to be dispersed into a liquid flow passing through said body ends,

said body defining a pooling chamber of annular configuration receiving fluid flow from said standpipe,

said pooling chamber being fluid flow connected to said fitting outlet end,

said body and said standpipe comprising an assembly for dispersing gas from said source into the liquid flow including Venturi action means for drawing and dispersing the gas in the liquid flow induced by the kinetic energy of the liquid flow through said fitting body,

check valve means in said conduit means for precluding liquid backflow to the gas source,

said body defining a second fluid flow passage extending between said ends thereof,

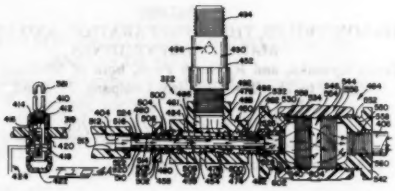
with the first mentioned passage being in fluid flow communicating relation to said second body passage,

said conduit means being connected to said standpipe,

a sleeve defining inner and outer annular side surfacings and being mounted in said fitting body second passage in substantially centered relation thereto and extending longitudinally of said second passage,

said sleeve defining fluid receiving and discharge ends,

means for effecting substantially laminar flow of the liquid longitudinally of and along said sleeve internal side surfacing between said ends of same, whereby at said discharge end of said sleeve an annular low pressure fluid homogenizing mixing zone is defined,



means for conveying the gas flow from the standpipe and said first body passage into annular relation with said sleeve discharge end whereby the gas flow at said sleeve discharge end is sucked into swirling mixing relation with the liquid flow 360 degrees substantially uniformly about said mixing zone,

said effecting means and said conveying means comprising said Venturi action means,

said sleeve comprising a tube extending between said ends of said fitting body,

said tube being anchored to said fitting body adjacent said inflow end of said fitting,

said tube at said fluid receiving end of same being dammed 360 degrees thereabout between said outer side surfacing thereof and said fitting,

said standpipe, said fitting body, and said tube defining a gas flow pooling chamber 360 degrees about said tube outer side surfacing,

said first passage communicating with said pooling chamber,

a tubular member mounted in said outflow end of said fitting body in substantially concentric relation to said tube, with said tube discharge end projecting into said tubular member in spaced relation thereto and terminating therein,

said tubular member and said tube discharge end forming an annular Venturi orifice about said tube discharge end

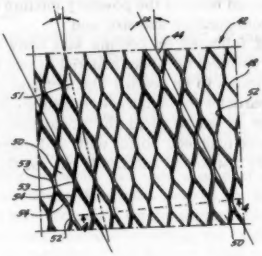
through which the gas flow discharges into said mixing zone that comprises said Venturi action means.

4,562,015

OPEN MESH FILL ASSEMBLY

Marcel R. Lefevre, Ft. Myers, Fla., assignor to The Munters Corporation, Ft. Myers, Fla.

Filed May 22, 1984, Ser. No. 612,923
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—94 **5 Claims**



1. A fill assembly adapted to effect contact between a gas and a liquid, which comprises:

a plurality of facially-opposed corrugated sheets of material disposed in a substantially vertical, parallel relationship, all of the corrugations in each of the sheets being disposed at an angle to the vertical, and each of the corrguations extending in substantially straight lines at least partially between one edge of the sheets and another edge thereof, with the corrugations in alternate sheets crossing the corrugations in the sheets disposed between the alternate sheets, adjacent corrugated sheets defining therebetween channels for the passage of a gas and gravitating liquid therethrough the liquid being urged by gravity to flow along the surfaces of the sheets in the direction of maximum slope, said sheets being formed of a foraminous material comprising an open-mesh network of interconnected webs, the interconnected webs being arranged to define a plurality of hexagonal openings with at least two opposite sides being parallel and disposed substantially in the direction of maximum slope, each opening being of sufficient size to prevent the gravitating liquid from filming thereacross, each opening being symmetrical about at least one axis thereof and arranged within the sheet material so that said at least one axis of symmetry is oriented substantially in the direction of maximum slope, wherein the hexagonal openings interrupt the natural flow of the liquid and cause the liquid to divide around the openings and flow along the interconnecting webs, whereby the liquid is distributed broadly over the surface of the sheets, wherein the direction of maximum slope is disposed at substantially an angle γ from the vertical, and wherein the angle γ is calculated from the following equation:

$$\text{Tan. } \gamma = \frac{\text{Tan. } \alpha}{1 + [A/(H \times \cos \alpha)]^2}$$

where

γ= the angle from the vertical of the direction of maximum slope;

α= the fluting angle, i.e., the angle at which the corrugations are disposed from the vertical;

A= the transverse pitch of the corrugations, measured from peak to valley; and

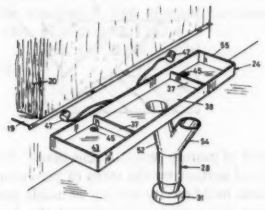
H= the height of the corrugations, measured from peak to peak.

4,562,016

EVAPORATIVE AIR-CONDITIONER WATER BLEED-OFF SYSTEM

Anthony D. Colliver, St. Marys, Australia, assignor to F.F. Seeley Nominees Pty. Ltd., St. Marys, Australia

Filed Oct. 23, 1984, Ser. No. 663,892
Claims priority, application Australia, Oct. 24, 1983, PG2019
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—106 **9 Claims**



1. In an evaporative air conditioner having a base tank which serves as a water reservoir, side panels upstanding from said base tank around the periphery thereof, said base tank having a base wall with a drain outlet at least one of said side panels comprising frame means for supporting a filter pad;

a water bleed-off means comprising:

a water receiving tray positionable in the base tank so as to lie beneath a filter pad supported by said frame means, the length of said tray being substantially less than the width of a filter pad supported by said frame means, said tray being provided with depending drain means arranged to communicate with said drain outlet in the base wall of said base tank, the upper end of said drain means being in water flow communication with the interior of said tray, the arrangement being such that when the conditioner is in use, some of the water draining from the bottom of the filter pad is collected by said water receiving tray and thence bled to drain through said drain means.

4,562,017

PROCESS FOR THE PRODUCTION OF CERAMIC FUEL TABLETS

Milan Hrovat, Rodenbach; Hans Huschka; Lothar Rachor, both of Hanau, and Dieter Vollath, Stutensee, all of Fed. Rep. of Germany, assignors to Nukem GmbH, Hanau, Fed. Rep. of Germany

Filed Sep. 14, 1983, Ser. No. 532,151
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1982, 3235207
Int. Cl.[4] G21C *21/00*
U.S. Cl. 264—0.5 **23 Claims**

1. In a process for the production of ceramic fuel pellets which contain fission material, fertile material, or a mixture of fission material and fertile material in oxidic form by heating corresponding green premolded pellets to a temperature below 2500° C. and above 1200° C., quickly transferring into a die, impact compressing at a molding pressure below 1000 MN/m^2 within a few milliseconds, ejecting the pellets and cooling, the improvement comprising carrying out the heating, compressing, ejecting, and cooling in a reducing atmosphere and carrying out the heating and cooling stepwise wherein the heating and cooling rate below 1200° C. are less than 30° C./second and above 1200° C. is greater than 30° C./second.

4,562,018

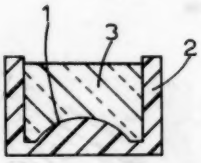
METHOD OF CASTING OPTICAL SURFACES ON LENS BLANKS

Charles W. Neefe, P.O. Box 429, Big Spring, Tex. 79720

Filed Jan. 28, 1985, Ser. No. 695,721

Int. Cl.⁴ B29D *11/00*

U.S. Cl. 264—2.7 **14 Claims**



1. A method of casting resinous lens blanks having a finished concave optical surface by the steps of providing a cylindrical shaped resinous mold cavity having an inside diameter equal to or larger than the outside diameter of the lens blank and a curved optical surface aligned with a peripheral orientation ring present at the bottom of the resinous cylindrical shaped mold, filling the resinous mold with a selected liquid lens monomer covering the optical surface and the peripheral orientation ring, allowing the lens monomer to polymerize to form a solid monolithic mass adhering to the cylindrical sides of the mold and to the curved optical surface, cutting the cylindrical sides of the resinous mold from the sides of the solid lens blank, removing the lens blank from the optical surface of the resinous mold, truing the flat surface opposite the concave optical surface and the orientation ring parallel with the peripheral orientation ring.

4,562,019

METHOD OF PREPARING PLASTOMERIC MAGNETIC OBJECTS

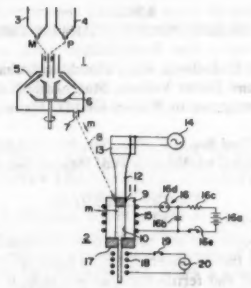
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Continuation of Ser. No. 376,716, May 10, 1982, abandoned, which is a continuation of Ser. No. 123,488, Feb. 21, 1980, abandoned. This application Jul. 30, 1984, Ser. No. 636,063

Claims priority, application Japan, Feb. 23, 1979, 54-20356; Feb. 27, 1979, 54-22366; Feb. 27, 1979, 54-22367

Int. Cl.⁴ B06B *1/02*

U.S. Cl. 264—24 **8 Claims**



1. A method of preparing an elastically deformable magnetic object, comprising the steps of:

(a) treating a magnetic material in the form of fine magnetic particles with a settable liquid organic substance selected from the group which consists of itaconic acid, acrylic acid, acrylic resin adhesive, lauric acid, liquid phenol, phenol-resorcinol, N-oxydiethylene-benzothiazylsulfonamide, tetramethylthiuramdisulfide, resorcin-formalin and silane compounds for polarizing the surfaces of the individual magnetic particles;

(b) mixing in a preselected proportion the magnetic material treated in step (a) and in the form of individual magnetic particles having respective layers of said liquid organic substance coated thereon in an unset state with a rubber material selected from the group consisting of natural, SBR, neoprene, polybutadiene and silicone rubbers in a pulverized form to form a powdery mass of a uniform mixture thereof;

(c) shaping said mass under pressure in a magnetic field into a compacted body of the powdery mixture of a predetermined configuration and size; and

(d) heating followed by cooling said body to allow said powder particles of rubber material to join and said magnetic particles to be bonded together and to said joining rubber particles through the intermediary of said organic substance as set to yield the homogeneous, elastically deformable magnetic object with said magnetic particles uniformly distributed and firmly carried therein.

4,562,020

PROCESS FOR PRODUCING SELF-SUPPORTING GLUCAN FILM

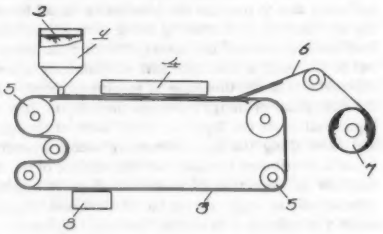
Hiromi Hijiya, and Toshio Miyake, both of Okayama, Japan, assignors to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Okayama, Japan

Filed Dec. 1, 1983, Ser. No. 556,957

Claims priority, application Japan, Dec. 11, 1982, 57-217196; Aug. 17, 1983, 58-149993

Int. Cl.⁴ B29D *7/02*

U.S. Cl. 264—39 **10 Claims**



1. A process for producing self-supporting film of a glucan consisting essentially of repeating maltotriose units, said process consisting essentially of:

providing an aqueous solution of the glucan having a concentration in the range of 10–50 w/w % and an inorganic substance content in the range of 0.02–5.0 w/w %;

casting the solution on a corona-treated endless heat-resistant plastic belt to give a uniform layer having a depth in the range of 0.01–0.5 mm;

drying the solution thereon while heating with 40°–100° C. air; and

releasing the resultant self-supporting film therefrom.

4,562,021
METHOD OF MANUFACTURING A MEDIUM FOR MICROFILTRATION, FOR ULTRAFILTRATION, OR FOR REVERSE OSMOSIS

Jean-André Alary, Montpellier; Louis Cot, Clapiers; Francis Guglermotte, Saint Jean De Cornies; André Larbot, Saint Clement, and Christian Guizard, Puecharbon, all of France, assignors to Ceraver, S.A., Paris, France

Filed Sep. 5, 1984, Ser. No. 647,481
Claims priority, application France, Sep. 6, 1983, 83 14212; Nov. 23, 1983, 83 18648
Int. Cl.[4] B28B *1/26;* B28C *1/02;* B29D *27/08*
U.S. Cl. 264—43 9 Claims

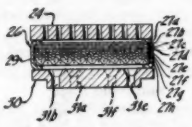
1. A method of manufacturing a medium for microfiltration, for ultrafiltration, or for reverse osmosis, wherein hydrolysis is performed on an alkoxide, an organo-metallic compound, or a metal salt of an organic or an inorganic acid, optionally dissolved in an anhydrous organic solvent, in order to obtain a sol of particles of the oxide or of the hydroxide of the corresponding chemical element, a thickening agent is added to the sol, and the resulting sol is slip cast onto a support layer having pores which are larger than pores desired for the filter medium, the thin layer deposited on the support medium is then dried, and then heat treated to eliminate the thickening agent and to sinter the particles of the deposited thin layer,

characterized in that the thickening agent is added to the sol in conjunction with a strong acid whose anion does not form a complex with ions of the oxide or hydroxide metal, and in that the slip casting is performed by mere putting into contact without filtering.

4,562,022
PRODUCING FOAMED FIBERS

Hsin L. Li, Parsippany, and Hendrikus J. Oswald, Morristown, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Apr. 29, 1983, Ser. No. 490,070
Int. Cl.[4] B29D *27/00;* B29F *3/04*
U.S. Cl. 264—54 14 Claims



1. A method of forming foam fibers which comprises the steps:

(a) forming at elevated temperature and under super atmospheric pressure a melt of a polymer of fiber forming molecular weight in which is admixed a blowing agent;

(b) extruding said melt through a spinerette having at least one aperture with said melt passing through a distributor plate and at least one additional member comprising a plurality of small channels upstream of said at least one spinerette aperture;

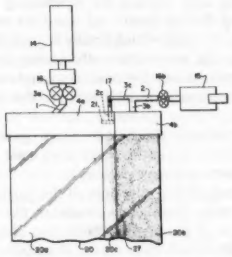
(c) quenching said melt downstream of said at least one spinerette aperture under conditions at which a plurality of predominately closed-cell bubbles form in said melt; and

(d) drawing said melt as it is quenched.

4,562,023
PROCESS AND APPARATUS FOR PRODUCING A SYNTHETIC RESIN SHEET HAVING A COLORED BAND OF VARYING COLOR INTENSITY

Horst Pabst, St. Augustin-Hangelar, and Hans Brinkmann, Troisdorf, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 405,405, Aug. 5, 1982, Pat. No. 4,476,075. This application Oct. 25, 1983, Ser. No. 545,239
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1981, 3132509; Oct. 27, 1982, 3239782
Int. Cl.[4] B29F *3/10*
U.S. Cl. 264—75 8 Claims



1. A process for producing a sheet exhibiting a colored band of varying color intensity, wherein a melt stream of a thermoplastic synthetic resin plasticized in an extruder is fed to a slot die tool and spread out by way of a distributor duct with throttle zone in the transverse direction to the sheet extrusion direction, and then traverses, in parallel to the extrusion direction, a height-adjustable forward zone up to the nozzle orifice, and wherein another melt stream of dyed or colored thermoplastic synthetic resin is injected into this melt stream upstream of the nozzle orifice, characterized in that a colorless melt stream and a dyed melt stream are shaped respectively into sheets each of a desired width Ba and Bb, respectively, and prior to exiting from the die, are melted together along a lateral edge into a sheet 20 having a width Ba+Bb; and in that there is introduced, along a width Bc, calculated from a transition line of the dyed sheet, into the region of the colorless sheet a wedge-like extending colored band from a partial stream of the dyed melt stream by way of a slot die having a wedge-shaped orifice and arranged, as seen in the extrusion direction, upstream of a back pressure plate and downstream of the distributor duct, with a corresponding displacement of the colorless melt stream.

2. An apparatus for producing a sheet containing a colored band, with an extruder for melting a stream of thermoplastic synthetic resin and with a slot die tool having a distributor duct with a throttle zone located upstream thereof, with a back pressure plate, with a forward zone formed between an upper lip and a lower lip including a wide nozzle orifice to shape the sheet, wherein the slot die tool furthermore comprises an injection port for an additional, thermoplastic partial melt stream; said injection port comprising a small slot die as seen in the extrusion direction positioned at the forward side of the back pressure plate of the slot die tool and a nozzle plate attached in front thereof, with a narrow nozzle orifice extending at right angles to the extrusion direction along the front edge of the back pressure plate.

4,562,024

PROCESS FOR PREPARING GRANULATE CONTAINING POORLY COMPRESSIBLE MEDICINALLY ACTIVE MATTER

Alan G. Rogerson, Newcastle, United Kingdom, assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 511,428, Jul. 6, 1983. This application Aug. 8, 1983, Ser. No. 520,975

Claims priority, application United Kingdom, Jul. 6, 1982, 8219487; Ireland, Jul. 5, 1983, 1577/83

Int. Cl.⁴ C09C *1/56*

U.S. Cl. 264—117 27 Claims

1. In a process for manufacturing granulate which may be formed into tablets by compressing and compacting a suitable granulate, wherein the granulate is prepared by forming an intimate mixture of particulate solid materials including poorly compressible medicinally active matter and tabletting aids, as well as other pharmacologically inert materials, thereafter wet granulating said mixture by moistening it with non-solvent granulating fluid to form a substantially uniform, moist, coherent, non-pasty mass which finally is granulated and dried, these dried granules, after optionally adding further tabletting aids thereto, constituting the desired granulate ready for compression and compaction into tablets, the improvement which comprises:

(A) predetermining the quantity of granulating fluid needed to convert the entire particulate solid mixture into a moist, coherent, non-pasty mass;

(B) homogenizing part only of the particulate solid material, separately from the remainder thereof, with a chosen amount of granulating fluid, that chosen amount being at least 90% by weight of the aforesaid predetermined quantity of granulating fluid, so as to form a substantially homogenous slurry wherein the percentage by weight of solids in the slurry is at least 25% w/w and

(C) moistening the remaining part of the particulate solid material in the manner of wet granulation with the slurry resultant from step (B) above and thereafter with any remaining granulating fluid, so as thus to form a substantially uniform, moist, coherent, non-pasty mass ready for granulation.

4,562,025

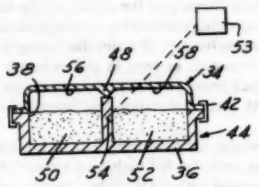
MOLD METHOD AND APPARATUS FOR MULTI-COLOR PLASTIC SHELLS

John D. Gray, New Durham, N.H., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed May 25, 1984, Ser. No. 614,004

Int. Cl.⁴ B29C *39/12, 41/04*

U.S. Cl. 264—126 13 Claims



1. In a process for molding a single-piece multi-color plastic shell the steps comprising

(1) heating an open-ended mold to a temperature near the fusing temperature of a plastisol material;

(2) connecting charge box means to the mold to form a closed system with at least two color plastisol sources;

(3) initially disposing the mold in the closed system so that the mold is vertically above the charge box means whereby no plastisol material is pre-cast on the mold and sealing an interior portion of the charge box means to a mold divider means to separate a preheated mold into first and second color casting surfaces;

(4) thereafter rotating the charge box means and mold in a powder casting sequence to release plastisol charges of a separate color onto each of the casting surfaces by gravity to build up a shell of desired shape and size;

(5) and controlling flow of the separately cast colors at the mold divider means to cause the separately cast colors to join so as to form an integral joint between the plastisol cast on the first and second casting surfaces.

4,562,026

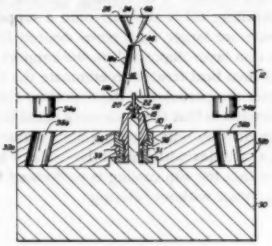
COMPRESSION MOLDING AGAINST AN INSERT

Mark D. Mosher, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 15, 1984, Ser. No. 589,809

Int. Cl.⁴ B29C *43/18*

U.S. Cl. 264—135 5 Claims



1. A method of compression molding a molding compound to an insert having a first surface so that the resulting molded object contains a pin hole of a predetermined cross-sectional area extending through the insert and into the compound for a predetermined length, said method comprising the steps of:

obtaining a mold plate having a mold cavity, said cavity having a shape defined by an upper section having upper cavity walls and by lower cavity walls, said lower cavity walls being shaped to allow registration with the first surface of the insert;

providing an aperture through the insert, said aperture having a cross-sectional area corresponding to the cross-sectional area of the pin hole;

installing a pin through said aperture, said pin extending beyond the insert for a length equivalent to the length of the pin hole, and said pin having a cross-sectional area corresponding to the cross-sectional area of the pin hole;

providing an extrusion vent between said upper section and the exterior of said mold plate;

allowing curing gasses and excess molding compound to escape said mold cavity through said extrusion vent;

loading the molding compound around said pin and between the insert and said mold cavity;

pressing the insert and pin into said mold cavity until the first surface of the insert is abutting said lower cavity walls to close said mold cavity; and

removing said pin from the resulting molded object.

4,562,027

PROCESS FOR MAKING CAST THERMOPLASTIC FILM WITH INTEGRAL CLOSURES

Raymond D. Behr, and Larry M. Zieke, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

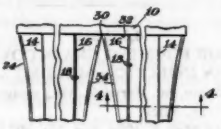
Filed Mar. 21, 1984, Ser. No. 591,662

Int. Cl.⁴ B28B *11/16*

U.S. Cl. 264—146 3 Claims

1. The process of forming integral thermoplastic fastener profiles on a cast film or sheet in an essentially erect disposition and to include a thickened ridge along each edge of said film,

wherein the portion of the film below at least one of the profiles forms a profile base which is thicker than an adjacent portion of the film, comprising the steps of extruding from a die lip film of a width sufficient to carry two or more pairs of fastener profiles integrally therewith, placing immediately



adjacent said die lips means to split the width of the film between profiles of adjacent pairs of profiles to form the film into separate sheets of film for each pair of profiles, each of such sheets having essentially erect profiles and beaded edges along each side thereof.

4,562,028

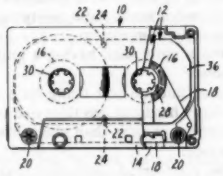
METHOD FOR PRODUCING A BOWED CASSETTE SHIM

Norman E. Nelson, Roseville, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 337,629, Jan. 7, 1982, Pat. No. 4,458,858. This application May 14, 1984, Ser. No. 610,047

Int. Cl.⁴ B29C *17/02*

U.S. Cl. 264—160 **13 Claims**



1. A method for forming a shim adapted to be inserted between a case and side surfaces of spools in a cassette, said method comprising the steps of:

providing a thin sheet of resilient elastic polymeric material having opposite surfaces;

causing particles to impact at least one of the surfaces of the sheet until a layer-like portion of the sheet adjacent one of the surfaces applies a stress in all directions along a layer-like portion of the sheet adjacent the other of the surfaces to cause the sheet to bow uniformly; and

cutting the sheet to form the shim.

4,562,029

SELF-CRIMPING POLYESTER YARN

William B. Black, Pensacola, Fla., assignor to Celanese Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 583,801, Mar. 2, 1984, abandoned, which is a continuation of Ser. No. 373,755, Apr. 30, 1982, abandoned, which is a continuation-in-part of Ser. No. 267,482, May 26, 1981, abandoned, which is a continuation-in-part of Ser. No. 157,130, Jun. 6, 1980, abandoned. This application Jan. 31, 1985, Ser. No. 696,953

Int. Cl.⁴ D01D *5/20*

U.S. Cl. 264—167 **23 Claims**

1. A process for forming a yarn, comprising melt spinning a plurality of polyester filaments having shrinkage peaks and valleys out of phase from filament to filament, wherein one or more of said plurality of filaments is generated by the steps comprising:

a. extruding from at least one group of at least two substantially parallel spinneret capillaries at least first and second molten streams of polyester polymer of fiber-forming molecular weight, said first stream being extruded at a greater velocity than said second stream and being spaced laterally from said second stream a finite distance selected such that said first and second streams periodically unite below said spinneret to form a combined stream having thick and thin regions;

b. coalescing and attenuating each combined stream prior to quenching and solidifying each said combined stream into an individual filament;

c. withdrawing said each filament from said combined stream at a spinning speed of at least about 1500 meters per minute, said spinning speed and the velocities and lateral spacing upon extrusion of said first and second streams being selected such that said shrinkage peaks and valleys along said one filament are substantially regular and periodically spaced; and,

d. gathering together said filaments into a yarn bundle.

4,562,030

PROCESS FOR MANUFACTURE OF GLASS FIBER-REINFORCED CEMENT NON-PLATE ARTICLE

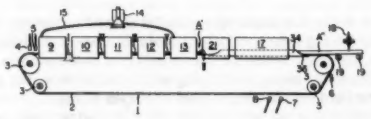
Keizo Sakaguchi, Kawanishi, and Shigeru Takeuchi, Osaka, both of Japan, assignors to Kurimoto Iron Works, Ltd., Osaka, Japan

Division of Ser. No. 222,861, Jan. 7, 1981, Pat. No. 4,412,561. This application Oct. 18, 1983, Ser. No. 543,181

Claims priority, application Japan, Jan. 11, 1980, 55-2834; Apr. 28, 1980, 55-58227

Int. Cl.⁴ B32B *13/02*

U.S. Cl. 264—173 **14 Claims**



1. A continuous process for manufacturing a glass fiber-reinforced, hydraulic cement, nonplanar article which comprises the steps of:

forming a first layer comprising a mixture of Portland cement mortar and chopped glass fiber strands on a planar upper flight of a conveyor belt which is horizontally moving in the lengthwise direction thereof;

then forming a second layer comprising continuous glass fibers directly on first layer as said first layer continues to move on said conveyor belt;

then forming a third layer comprising regulated set cement mortar directly on said second layer as said first and second layers continue to move on said conveyor belt;

then forming a fourth layer comprising continuous glass fibers directly on said third layer as said first, second and third layers continue to move on said conveyor belt;

then forming a fifth layer comprising chopped glass fiber stands on said fourth layer as said first, second, third and fourth layers continue to move on said conveyor belt to form a laminated layer structure consisting of said first, second, third, fourth and fifth layers;

then contacting, as said laminated layer structure continues to move on said conveyor belt, the upper face defined by

said fifth layer of said layer structure with an inner mold, and lifting said layer structure from beneath with an outer mold at opposite lateral side portions of said layer structure, said outer mold being of a shape effective to lift said opposing lateral side portions of said layer structure into conforming, shaping contact with said inner mold, thereby forming said laminated layer structure into a nonplanar, glass fiber-reinforced, hydraulic cement article; and

then continuously passing the thus-formed glass fiber-reinforced, nonplanar, hydraulic cement article on said conveyor belt through a curing zone effective to rapidly set said regulated set cement mortar and harden said article sufficiently so that said article retains its shape.

4,562,031

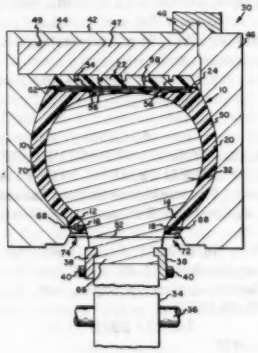
PROCESS FOR CASTING REINFORCED TIRES

Robert K. Rossi, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 2, 1982, Ser. No. 344,985

Int. Cl.⁴ B60C *1/00;* **B22H** *3/08*

U.S. Cl. 264—255 **3 Claims**



1. A method of molding a toroidal shaped pneumatic tire in a mold having lower and upper mold sections and a tread ring in the lower mold section comprised of a radially outer tread portion, a tire casing underlying said tread portion and a reinforcing cord belt having at least one layer of fabric positioned between said tread portion and said tire casing, said method comprising the steps of:

(a) forming said tread portion by introducing and centrifugally casting a predetermined quantity of elastomer-forming material into a space at the radially outer portion of said mold in communication with an opening between inner edges of said lower and upper mold sections and molding, reacting and at least partially curing said material to form said tread portion with an inside surface in communication with said opening prior to forming said tire casing;

(b) centrifugally casting a skim coat of an adhesive on the inside surface of said tread portion in said mold to retain said cord belt on said inside surface during rotational casting of said tire casing;

(c) positioning said cord belt on the inside surface of said tread portion in said mold with the edges equidistant from a centerplane of said tire after said tread portion is formed in said mold and fastening said cord belt to said tread portion by pressing said cord belt against said tread portion;

(d) assembling and inserting a core in said mold;

(e) forming said casing by introducing and rotationally casting a predetermined quantity of liquid reaction mixture of elastomer-forming material into the space between said core, said mold and said tread portion, reacting and at least partially curing said mixture to form said casing overlapping and integrally adhered to said reinforcing cord belt and said tread portion; and

(f) removing said formed tire and core from said mold and removing said core from said tire.

4,562,032

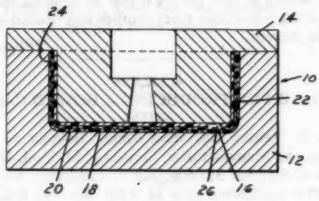
METHOD FOR FORMING GRAIN COVERINGS ON REACTION INJECTION MOLDED ARTICLES

Laurent R. Gaudreau, So. Berwick, Me., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed May 4, 1984, Ser. No. 607,063

Int. Cl.⁴ B29C *45/00, 45/16;* **B32B** *3/30, 5/20*

U.S. Cl. 264—267 **3 Claims**



1. A reaction injection molding process for forming a finished article having an undistorted grained surface on a vinyl shell component loaded into a mold cavity capable of repeated openings and closings comprising:

(a) pre-forming a vinyl shell having a grained surface of a first hardness;

(b) providing an integral soft lining on a mold part of the cavity having a hardness less than that of said vinyl shell and a thickness greater than the surface relief of the grained surface;

(c) loading the pre-formed vinyl shell into the mold cavity with its grained surface in engagement with the soft lining;

(d) closing the mold;

(e) supplying the mold cavity with a reaction injection molding material mixture;

(f) allowing the reaction of the ingredients injection into the mold cavity to go to completion;

(g) holding the surface relief of the vinyl shell against the soft lining so as to prevent grain distortion by the substrate material of the pour mold cavity.

4,562,033

METHOD OF MANUFACTURING ARTICLES FROM A COMPOSITE MATERIAL

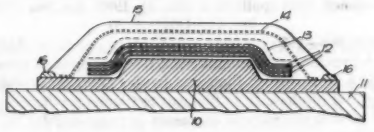
Frank C. Johnson, Nottingham, and Susan M. Newsam, Derby, both of England, assignors to Rolls-Royce Limited, London, England

Filed Jun. 21, 1983, Ser. No. 506,422

Claims priority, application United Kingdom, Jul. 24, 1982, 8221467

Int. Cl.⁴ B29B *9/04*

U.S. Cl. 264—510 **6 Claims**



1. A method of vacuum moulding an article from a filament reinforced composite material comprising the steps of

(1) laying up, on a suitable former, a plurality of prepregs,

each comprising reinforcing filaments enclosed in an uncured resin,

(2) overlaying at least a major portion of the exposed surface of said laid-up prepregs with at least one sheet of a microporous film material which acts as a barrier to particles which are greater than 0.04 microns in size and which film is premeable to gases and vapours but impermeable to liquid resin,

(3) overlaying at least a major portion of said sheet of microporous film material with a breather material,

(4) enclosing said laid-up prepregs, said at least one sheet of microporous film material and said breather material with a gas impermeable membrane,

(5) evacuating the volume enclosed by said membrane and maintaining said prepregs at room temperature a sufficient time to preconoslidate said prepregs

(6) then gradaully increasing the temperature of said prepregs to a temperature which is high enough to cause the resin in said prepregs to outgas and become sufficiently mobile to permit the coalescing and moulding of said prepregs to take place and for said resin to subsequently gel but low enough for outgasing to be substantially completed before said gelling commences, and holding said temperature for a sufficient time for said outgasing, moulding and gelling to occur, subsequently

(7)gradually increasing the temperature of said prepregs to 45 centrigrade degrees higher than the temperature of outgassing step (6). and holding said increased temperature a sufficient time to cure said resin, and then

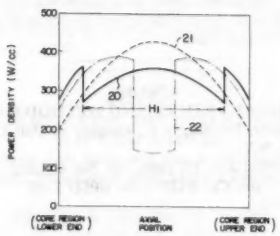
(8) reducing the temperature followed by discontinuing said evacuating and removing the resultant article from said former.

4,562,034

FAST BREEDER

Kikuo Umegaki, Hitachi, and Kotaro Inoue, Ibaraki, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 22, 1983, Ser. No. 506,867
Claims priority, application Japan, Jun. 23, 1982, 57-106856
Int. Cl.⁴ G21G *1/06*
U.S. Cl. 376—172 **6 Claims**



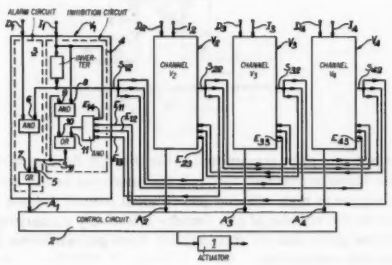
1. A fast breeder comprising a core including a driver core region containing Pu-fissile material and a blanket region surrounding said driver core region, said blanket region containing a fertile material as a main component, said driver core region including an inner core region uniformly enriched with Pu-fissile material and an outer core region uniformly enriched with Pu-fissile material, said outer core region being disposed between said inner core region and said blanket region in axial and radial direction of said core so as to surround said inner core region, said inner core region having a volume of between 30 and 70% of the volume of said driver core region, and said inner core region having an enhancement of Pu-fissile material of between 30 and 80% of the enhancement of Pu-fissile material in said outer core region.

4,562,035

LOGIC SAFETY SYSTEM

Yves Plaige, Bures sur Yvette, France, assignor to Commissariat a l'Energie Atomique, Paris; Framatome, Courbevoie and Merlin-Gerin, Grenoble, all of, France

Filed Nov. 13, 1981, Ser. No. 320,978
Claims priority, application France, Nov. 26, 1980, 80 25068
Int. Cl.⁴ G21C *17/00*
U.S. Cl. 376—215 **9 Claims**



1. A logic safety system for triggering off the protective action of a safety actuator, comprising:

a whole number m of redundant channels for the controlling of the triggering of the protective action, said channels being connected by respective outputs to the inputs of a logic circuit for controlling the triggering of the protective action for triggering off said action whenever at least two of the m channels have supplied a protective action triggering control signal in response to an alarm signal received by at least the two said channels, wherein each of the said channels comprises a logic alarm circuit receiving the alarm signal at one input, a logic inhibiting circuit for inhibiting the logic alarm circuit and for receiving at a control input an inhibition control signal, said inhibition circuit being connected to an inhibition input of said alarm circuit for receiving an inhibition signal output by said inhibition circuit and wherein said inhibition circuit further comprises a safety means for outputting a first safety signal to a safety input of said alarm circuit,

whereby when the logic inhibition circuit of one of said channels receives at its inhibition control input an inhibition control signal simultaneously with an inhibition control signal being received by an inhibition control input of another one of said channels, said safety means of said inhibition circuit of said one channel applies said first safety signal to said safety input of said alarm circuit thereby providing a trigger control signal for controlling the triggering of the protective action at an input of the alarm circuit corresponding to the output of said one channel.

4,562,036

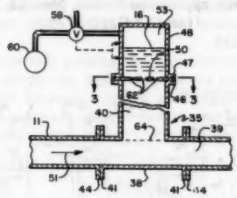
SHOCK WAVE ABSORBER HAVING APERTURED PLATE

Yong W. Shin, Western Springs; Arne H. Wiedermann, Chicago Heights, both of Ill., and Carl E. Ockert, Vienna, Va., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 26, 1983, Ser. No. 526,765
Int. Cl.⁴ G21C *9/00*
U.S. Cl. 376—283 **13 Claims**

1. In a piping system having a line carrying a liquid, a shock wave absorber in the line comprising, a housing interposed in series in the piping system line and sized generally larger than the line, an inner wall disposed generally horizontally in the housing and dividing the housing into a through flow section for the liquid and a vertically overlying laterally offset attenuation region, said inner wall having a plurality of apertures

therein, means for pressurizing and automatically controlling the pressure of a gas in said attenuation region in response to the level of liquid in said housing so that the liquid enters said region through the apertures and covers said inner wall while leaving an overlying volume of the gas, whereupon a signifi-



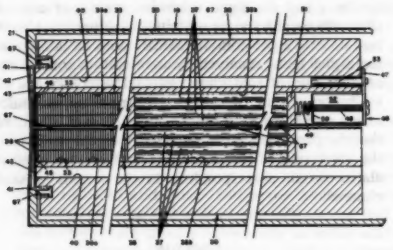
cant pressure pulse transmitted to the through flow section will cause liquid movement through the apertures in the attenuation region as high velocity jets of small overall volume compared to the volume of gas, thereby effectively attenuating the pressure pulse and its transmission through and beyond the shock wave absorber.

4,562,037

FURNACE ASSEMBLY

Nicholas F. Panayotou, Kennewick; Donald R. Green, Richland, both of Wash., and Larry S. Price, Pittsburg, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 24, 1983, Ser. No. 469,606
Int. Cl.[4] G21C *17/00*
U.S. Cl. 376—340 **29 Claims**



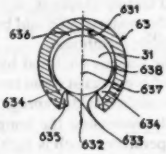
1. A method for heating test specimens to desired elevated temperatures for irradiation by a high energy neutron source comprising: generating a high energy neutron source having a primary irradiation volume, completely encapsulating two groups of specimens within an enclosure, positioning said two groups of encapsulated specimens axially within at least a portion of said primary irradiation volume, symmetrically locating said two specimen groups in a slightly radially spaced apart relation within said enclosure on opposite sides of the axis of said volume, heating said two groups of specimens to selected elevated temperatures, respectively, while simultaneously irradiating said specimens, and maintaining isothermal temperatures for said two groups of specimens within said enclosure at said selected temperatures.

4,562,038

DEVICE FOR GUIDING A CONTROL CLUSTER IN A NUCLEAR REACTOR

Raphaël Assedo, Chatou, and Eric Dubreux, Saint-Germain-En-Laye, both of France, assignors to Framatome & Cie, Courbevoie, France

Filed Nov. 15, 1982, Ser. No. 441,872
Claims priority, application France, Nov. 13, 1981, 81 21270
Int. Cl.[4] G21C *7/00*
U.S. Cl. 376—353 **6 Claims**



1. In a nuclear reactor comprising a control cluster (3) having a plurality of absorber rods (31) connected to a spider (4) having radial arms for suspension of said rods, a device for guiding said control cluster comprising

(a) a casing (61) surrounding the rods (1) of said cluster, said casing having a longitudinal central axis;

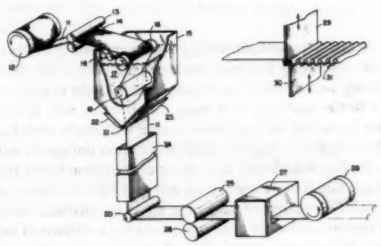
(b) a plurality of guide sleeves (63, 64) vertically arranged in said casing and each having a cylindrical slide (631, 641) for continuously guiding one absorber rod (31) and one longitudinal slot (632, 642) extending the length of said sleeve and extending radially toward said longitudinal central axis to enable passage therethrough of an arm of said spider (4), the width of said slot being less than the diameter of any of said absorber rods, said slot being defined by a pair of lips (633, 643) which terminate said slide, each of said lips being formed with an inner edge and an outer edge, each lip of said pair of lips having a plurality of cavities arranged in said inner edge along the length of said lip, said cavities causing said inner edge to be uneven, said cavities being positioned at the same height in each lip of said pair of lips so as to form a plurality of pairs of cavities, said pairs of cavities being so constructed and dimensioned as to communicate the interior of said slide to the outside of said sleeve in all positions of said rod in said slide.

4,562,039

POROUS METAL ARTICLE AND METHOD OF MAKING

Paul C. Koehler, Dryden, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Filed Jun. 27, 1984, Ser. No. 625,295
Int. Cl.[4] B22F *7/04*; B05D *5/00*
U.S. Cl. 419—2 **21 Claims**



1. A method of making a porous metal filter medium comprising:

(a) applying a stabilized or thixotropic suspension of a metal particulate dispersed in a fluid medium containing a stabilizing agent and a binding agent to a foraminate metal support, said suspension having a viscosity in the range of from about 200 to about 50,000 centipoise;
(b) working said support to fill the openings thereof with said suspension and to remove entrained gas;
(c) removing any excess of said suspension from said support;
(d) heating the filled support to dry said suspension and provide the filled support with green or unsintered strength, the drying of said suspension being carried out without contacting the filled support of step (c) with any surface until said filled support has been dried;
(e) compressing the dried, filled support to provide better contact between adjacent particles and greater mechanical strength; and
(f) sintering the compressed, dried, filled support to remove volatile material and fuse the individual particles of said metal particulate to each other and to said support;
wherein the individual particles of said metal particulate are no more than one-fifth the size of the openings of said foraminate metal support whereby a porous metal filter medium is provided capable of being formed about a bending radius five times the thickness of said medium.

4,562,040

METHOD FOR MANUFACTURING HIGH-STRENGTH SINTERED SILICON CARBIDE ARTICLES

Koichi Yamada; Masahide Mouri, both of Niihama, and Yoshisaburo Nomura, Uma, all of Japan, assignors to Sumitomo Aluminium Smelting Company, Ltd., Osaka, Japan

Filed Apr. 9, 1985, Ser. No. 721,663
Claims priority, application Japan, Apr. 13, 1984, 59-74228
Int. Cl.⁴ B22F *3/26*
U.S. Cl. 419—23 **9 Claims**

1. A method for manufacturing a sintered silicon carbide article excellent in mechanical properties comprising the steps of adding a tar pitch in an amount of 2–10 parts by weight, a boron compound in such an amount corresponding to 0.3–0.15 parts by weight of boron content and silicon powder in an amount of 0.3–3 parts by weight as densification aids to 100 parts by weight of a finely divided silicon carbide powder and mixing, shaping the resulting mixture, and then sintering the shaped green article in an inert atmosphere at a temperature of from 1900° to 2300° C.

4,562,041

METHOD OF REDUCING THE GREEN DENSITY OF A SLIP CAST ARTICLE

John A. Mangels, Flat Rock, and Ray A. Dickie, Birmingham, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jul. 8, 1983, Ser. No. 512,094
Int. Cl.⁴ B22F *1/00*
U.S. Cl. 419—40 **8 Claims**

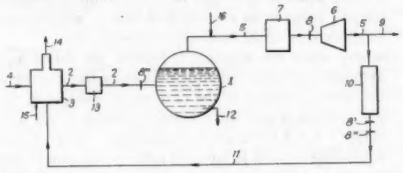
1. A method of reducing the green density of an article cast in a slip casting operation from a casting slip containing silicon metal particles, yttrium containing particles, and a small amount of a fluoride salt which is effective to suppress flocculation of the silicon metal particles by Y^{+3} ions derived from the yttrium containing particles;
said method characterized by the step of:
adding to the casting slip a small amount of a compound which will produce a cation which will partly flocculate the particles of silicon metal so that when the casting slip is cast into a casting mold, said partly flocculated particles of silicon will interrupt an otherwise orderly packing of the particles of silicon and particles of yttrium, whereby the green density of the slip cast article is reduced and said article may be more easily nitrided.

4,562,042

ANTICORROSIVE COMPOSITION

Francis Moran, Paris, France, assignor to Societe Anonyme dite: Union Chimique et Industrielle de l'Quest (U.C.I.O.-S.A.), Paris, France

Filed Aug. 2, 1984, Ser. No. 637,058
Claims priority, application European Pat. Off., Aug. 3, 1983, 83401611.5
Int. Cl.⁴ C23F *11/00*; C09D *5/10*
U.S. Cl. 422—13 **13 Claims**



1. A corrosion inhibiting composition for protecting metallic surfaces of circuits or systems using water as energetic or thermic fluid, and containing a generator of dry steam, wet steam, superheated water or hot water, said composition which contains a neutralizing amine component and a film-forming amine component comprising
(a) from 1 to 100 parts by dry weight of an amine component selected from the group consisting of neutralizing amines and mixtures thereof, and
(b) 1 part by dry weight of an amine component selected from the group consisting of film-forming polyamines of the formula

$$R\text{-}NH\text{-}(CH_2)_m\text{-}_nNH_2 \qquad (II)$$

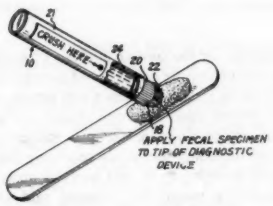
wherein, R is a saturated or unsaturated hydrocarbon radical having from 12 to 22 carbon atoms, m is an integer between 2 to 8 inclusive, and n is an integer between 1 to 7 inclusive; and mixtures thereof.

4,562,043

SELF-CONTAINED SWAB CARTRIDGE APPARATUS FOR DETECTING OCCULT BLOOD

Frederick C. Mennen, 506 Clay St., LaPorte, Ind. 46350, and Ronald Freake, P.O. Box 171, Tulsa Rosa, N. Mex. 88352

Filed Sep. 9, 1983, Ser. No. 530,649
Int. Cl.⁴ G01N *21/78, 33/72*; C12M *1/30*
U.S. Cl. 422—56 **7 Claims**



1. A self-contained swab cartridge apparatus for detection of occult blood in a fecal sample comprising:
a tubular flexible cartridge having a closed end and an open end;
A swab protruding from the open end of said cartridge for holding a sample of fecal matter;
a cap having an open end and a closed end and adapted to close said cartridge and cover said swab;

a chromogen-pledget positioned in said cap comprising a web of fibrous absorbent material that has been impregnated first with a precoating of an aqueous solution of hydroxyethylcellulose and a non-volatile acid buffer capable of providing a pH of between 5 and 7 during use and then further impregnated with a volatile solvent solution of 3,3',5,5'-tetramethylbenzidine and 6-methoxyquinoline;

an ampoule positioned in said cartridge between its closed end and the swab, said ampoule being made of frangible material and filled with a unit dosage of about 0.75–1 ml of a dilute aqueous hydrogen peroxide solution containing a wetting agent in an amount sufficient to assure complete solubilization of the hydroxyethylcellulose;

whereby when the ampoule is broken, the dilute aqueous hydrogen peroxide solution containing the wetting agent transports a sample to the chromogen-pledget in the cap and solubilizes said hydroxyethylcellulose along with the buffer, 3,3',5,5'-tetramethylbenzidine, and 6-methoxyquinoline to form an aqueous color development medium having a pH of between 5 and 7 and develop, in 1–2 seconds in the presence of any occult blood in the sample, a vivid green color that lasts 8 months or longer.

4,562,044

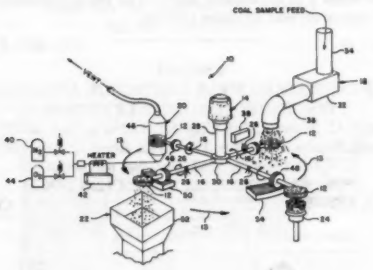
ON-LINE COAL ANALYZER

Thomas L. Bohl, Madison, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Continuation of Ser. No. 395,427, Jul. 6, 1982, abandoned. This application Aug. 27, 1984, Ser. No. 644,653

Int. Cl.⁴ G01N *35/02, 31/12*

U.S. Cl. 422—64 **9 Claims**



1. Apparatus for the on-line analysis of a coal sample comprising a porous sample cup of predetermined volume, a first station including means for filling said sample cup with a sample of pulverized coal, a second station including means for performing one or more analysis procedures on said sample, a third station including means for receiving the residue of said sample after completion of said analysis procedures, a fourth station including means for cleaning said sample cup, and means for indexing said sample cup sequentially from said first through said fourth stations and back to said first station, said first, second, third and fourth stations are arranged along a circular path; said indexing means comprises an indexing motor disposed centrally of said circular path, an arm extending radially from an output shaft of said indexing motor, and means attaching said sampling cup to said arm in position to traverse said circular path and means on said arm for providing a continuous indication of the weight of said sampling cup.

4,562,045

CARRIER FOR HOLDING ANALYTICAL SAMPLES

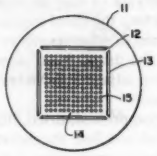
Michihiro Murata, Kyoto, Japan, assignor to Muratz Manufacturing Co., Kyoto, Japan

Continuation-in-part of Ser. No. 309,473, Oct. 7, 1981, Pat. No. 4,405,560. This application Feb. 24, 1983, Ser. No. 469,394

The portion of the term of this patent subsequent to Sep. 20, 2000, has been disclaimed.

Int. Cl.⁴ B01L *3/00*; G01N *1/28*

U.S. Cl. 422—102 **11 Claims**



1. A carrier for holding analytical samples to be subjected to X-ray analysis, said carrier comprising a carrier medium having a natural porosity such that solutions of an analytical sample are allowed to permeate into said medium by means of capillary action, said carrier medium being divided into an island-like portion to hold said samples and a surrounding region by a boundary zone formed of a plurality of slits and a plurality of support portions, each support portion located between adjacent slits in said boundary zone and said boundary zone defining a closed figure said support portions being subjected to a solution diffusion prevention treatment to prevent diffusion of said sample from said island-like region to said surrounding region and said island-like portion having formed therein a plurality of fine through-holes to reduce X-ray reflection and corresponding background intensity of said island-like portion, each of said fine through-holes having a diameter in the range of about 0.2 mm to 10 mm.

4,562,046

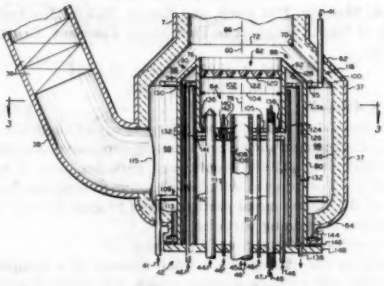
CATALYTIC CRACKING UNIT

George E. Hays; Richard H. Nielsen, both of Bartlesville, Okla.; Chester O. Bowen, and Floyd H. Holland, both of Borger, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 2, 1983, Ser. No. 557,552

Int. Cl.⁴ B01J *8/18*

U.S. Cl. 422—140 **29 Claims**



1. Apparatus comprising

(a) a lift pot defining a longitudinal axis, an inside diameter, a first end, a second end, and an interior surface;

(b) a line reactor having a first end and a second end with the second end connected to the first end of the lift pot, the

second end of said line reactor defining a first diameter which is less than the inside diameter of the lift pot;

(c) a tubular member extending into the lift pot from the second end of the lift pot, the tubular member having a longitudinal axis, a first end being spaced from and opening toward the second end of the line reactor, an exterior surface and an interior surface, an annulus being formed between the exterior surface of the tubular member and the interior surface of the lift pot, an acceleration zone being defined between the first end of the tubular member and the first end of the lift pot;

(d) a means for causing a first material to flow generally longitudinally into the second end of the line reactor from the tubular member; and

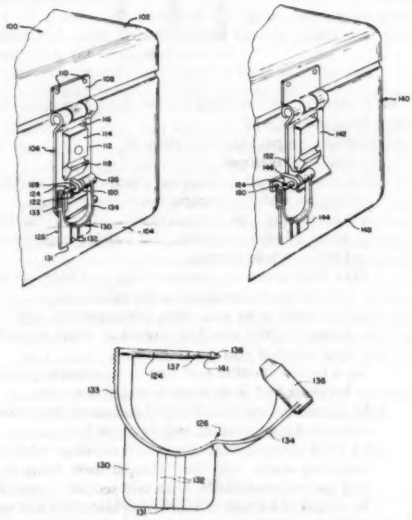
(e) a means for causing a second material to flow from substantially the entire annulus between the exterior surface of the tubular member and the interior surface of the lift pot through the acceleration zone and into the second end of the line reactor.

4,562,047

INDICATOR SEAL AND STERILIZER CONTAINER

Joseph T. Sestak, Erie, and Jonathan Kagan, Fairview, both of Pa., assignors to American Sterilizer Company, Erie, Pa.

Filed Dec. 19, 1983, Ser. No. 562,971
Int. Cl.[4] A61L *2/06*
U.S. Cl. 422—300 **3 Claims**



1. A disposable seal comprising a body portion and a resilient fracturable portion having two ends, said fracturable portion being connected to said body portion at one end and being free at the remaining end, said body portion defining a socket for receiving said remaining end, said socket and said remaining end being so configured that said remaining end can be inserted into and locked within said socket to lock said seal, unlocking said seal requiring the fracturing of said fracturable portion thereby destroying the utility of said seal as a seal, said body portion comprising an indicator portion that includes a sterilization indicator.

2. A container for holding articles while they are being subjected to a sterilization process, for storing the articles subsequent to the completion of the sterilization process, and for maintaining the degree of sterilization of the articles achieved during the course of the sterilization process, comprising:

a receptacle for receiving and supporting articles while they are being sterilized and stored;

a closure means associated with said receptacle which is capable of assuming an opened position in which access can be had to said receptacle to permit said receptacle to receive articles and to permit removal of articles from said receptacle, and a closed position in which said access cannot be had;

said closure means comprising means for permitting the flow of sterilant into said receptacle while preventing the entry of microbial life into said receptacle when said closure means is in its closed position;

a disposable sealing member for sealing said closure means in its said closed position, said sealing member comprising a fracturable portion, said sealing member being capable of being unsealed after it is sealed only by destroying the utility of said sealing member as a seal wherein fracturing said fracturable portion causing the utility of said sealing member as a seal to be destroyed, said sealing member being so secured to said container that movement of said closure means from its said closed position to an opened contaminating position, in which microbial life can enter said receptacle, requires fracturing said sealing member thus causing said sealing member to lose its utility as a seal; and

said sealing member further comprising an indicator portion that includes a sterilization indicator.

4,562,048

PROCESS FOR THE TREATMENT OF METAL-BEARING ORES

Oliver W. Moles; Kenneth L. Ensley, and Haywood A. Perkins, all of Mobile, Ala., assignors to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Filed Apr. 30, 1984, Ser. No. 605,475
Int. Cl.[4] C01G *23/00*
U.S. Cl. 423—81 **7 Claims**

1. In a hydrometallurgical process for the treatment of an iron-containing titaniferous ore, said process including leaching of said ore in a digestion zone with dilute aqueous mineral acid solutions selected from the group consisting of dilute sulfuric, hydrochloric, nitric and phosphoric acid solutions having free acid contents of below about 30 weight percent at elevated temperatures and pressures, the improvements which comprise:

initiating controlled venting of said digestion zone to remove process vapors, substantially in the form of water vapor, from said digestion zone and to cause boiling of the mixture of said ore and acid solution in the digestion zone, said venting being initiated after the temperature of the mixture has reached a value of from about 135° to about 140° C. and consumption of the free acid in said mixture has reached a value of from about 40 to about 80 weight percent of the free acid in said dilute aqueous acid solution and

continuing the venting of said digestion zone to remove the process vapors from said digestion zone and to maintain the mixture of said ore and said acid solution in the digestion zone in a state of boiling,

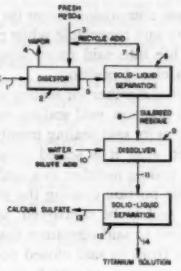
said venting of the digestion zone and boiling of said mixture of said ore and said acid solution providing for increased contact between said ore and said acid.

4,562,049

RECOVERY OF TITANIUM FROM PEROVSKITE BY ACID SULFATION

Monte B. Shirts, South Jordan; Dale A. Martin, and Allan E. Petersen, both of Salt Lake City, all of Utah, assignors to The United States of America as represented by Secretary of Interior, Washington, D.C.

Filed Sep. 20, 1984, Ser. No. 652,391
Int. Cl.[4] C01G *23/00, 23/053*
U.S. Cl. 423—82 **12 Claims**



1. A method for the recovery of titanium from calcium-titanium containing minerals found in ores or concentrates which comprises the steps of:

(a) digesting the ore or concentrate with boiling sulfuric acid to form a sulfated residue in unreacted sulfuric acid thus forming a slurry:

(b) removing the sulfuric acid from the sulfated residue slurry;

(c) leaching the sulfated residue in water using sufficient water to dissolve the contained titanium values from the insoluble calcium sulfate;

(d) removing the solid insoluble calcium sulfate by filtration;

(e) recovering an aqueous solution of the titanium; and

(f) precipitating the titanium from the aqueous solution.

4,562,050

PROCESS FOR PRODUCING BORON NITRIDE

Kikuo Koeda, and Chikara Ito, both of Ibaraki, Japan, assignors to Yukamelamin Company, Limited, Ibaraki, Japan

Filed Aug. 13, 1984, Ser. No. 640,121
Claims priority, application Japan, Aug. 25, 1983, 58-154126
Int. Cl.[4] C01B *21/06*
U.S. Cl. 423—290 **7 Claims**

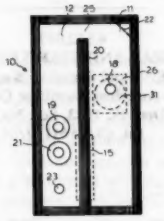
1. A process for producing boron nitride in a needle-like or filament-like crystal form having a diameter of from 0.1 to 15 μm and a length of from 5 to 150 μm which comprises reacting at least one boron compound selected from the group consisting of boric anhydride, boric acid and a metal salt of boric acid and at least one nitrogen-containing compound selected from the group consisting of urea, melamine, melam, melen, melon, dicyandiamide, ammelide, guanamines and salts of said nitrogen containing compounds in the presence of a solvent to form an addition product as a reaction product, the solvent being one which is capable of causing the reaction product to separate in needle-like or filament-like crystal form and being selected from the group consisting of alcohols, ketones, esters, alcohol esters, amides, aliphatic hydrocarbons, aromatic hydrocarbons, ketone esters, ketone alcohols and ether alcohols, separating the resulting compound from the solvent and thereafter heating the resulting compound in said needle-like or filament-like form at a temperature of at least 600° C. in an atomphere of inert or reducing gas.

4,562,051

GENERATION OF ANAEROBIC OR MICROAEROPHILIC ATMOSPHERE

Ralph T. Stoermer, III, Stewartstown, Pa., and James C. Darner, San Jose, Calif., assignors to Becton, Dickinson and Company, Paramus, N.J.

Filed Feb. 27, 1984, Ser. No. 584,174
Int. Cl.[4] B01D *53/36;* B01J *7/02, 8/02;* C12M *1/00*
U.S. Cl. 423—219 **25 Claims**



16. A method for removing oxygen from a gaseous mixture comprising the steps of

(1) providing a package consisting of

(a) a sealed envelope,

(b) a first catalyst containing compartment within said envelope, said first compartment comprising:

(1) an outside wall formed from portion of the bottom panel of said envelope, said outside wall having at least one hole therein,

(2) a flash arrestor positioned over said hole and immobilized on the inside of said outside wall,

(3) a cover over said first compartment, said cover being sealably attached around its edges to said bottom panel of said envelope, and,

(4) a catalyst within said first compartment positioned between said flash arrestor and said cover;

(c) a second compartment within said envelope containing material for generating hydrogen; and

(d) a third compartment within said envelope adapted for receiving water, said third compartment being in fluid and gas communication with said second compartment by means of a channel connecting said third and second compartments;

(2) inserting water into said third compartment of said package,

(3) placing said package in a sealable container having an atmosphere comprising oxygen.

4,562,052

PROCESS FOR THE REMOVAL OF NITROGEN OXIDES FROM NITRIC ACID PLANT TAIL GAS

George D. Grab, Bethlehem, and Sheldon W. Dean, Allentown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jul. 9, 1984, Ser. No. 629,034
Int. Cl.[4] C01B *21/00, 21/38, 21/40*
U.S. Cl. 423—235 **12 Claims**

1. A process for removing nitrogen oxides present in an off gas stream, said process comprising:

(a) scrubbing the nitrogen oxide containing off gas with 55%–70% nitric acid to absorb and oxidize the nitrogen oxides, thereby forming a combined HNO_2/HNO_3 stream and a purified off gas stream;
(b) heating the combined HNO_2/HNO_3 stream to between 50° and 150° C.;
(c) contacting the combined HNO_2/HNO_3 stream with a stripping stream to produce a concentrated HNO_3 stream and a concentrated nitrogen oxide stream;
(d) recovering the concentrated nitrogen oxide stream;
(e) recovering the concentrated HNO_3 stream and using a portion to scrub the nitrogen oxide containing off gas in step (a) and recovering the remainder as concentrated HNO_3 product; and
(f) contacting the purified off gas stream of step (a) with a scrubbing liquid to remove any residual HNO_3.

4,562,053

PROCESS OF CLEANING FLUE GASES FROM HEATING PLANTS

Finn Andersson, Greve Strand, Denmark, assignor to Desco K/S, Copenhagen, Denmark

PCT No. PCT/DK81/00118, § 371 Date Aug. 23, 1982, § 102(e) Date Aug. 23, 1982, PCT Pub. No. WO82/02151, PCT Pub. Date Jul. 8, 1982

PCT Filed Dec. 22, 1981, Ser. No. 413,350

Claims priority, application Denmark, Dec. 23, 1980, 5527/80

Int. Cl.⁴ C01B *21/00, 17/00*

U.S. Cl. 423—235 **6 Claims**

1. A process for cleaning flue gases containing nitrogen oxides and sulphur dioxide from heating plants, said process comprising the sequential steps of:

removing coarse solid particles from said flue gas;

passing said flue gas through an intermittent first shower of aqueous liquid;

immediately after, and immediately below, said step of passing said flue gas through an intermittent first shower of aqueous liquid, performing the step of reducing the temperature of said flue gas to between 20° and 30° C. by passing said flue gas and liquid from said first shower downward through a heat exchanger in which the flue gas does not directly contact a heat exchange fluid, whereby said aqueous liquid washes heat exchange surfaces of said heat exchanger;

passing said flue gas through a second shower of aqueous liquid, whereby a portion of nitrogen oxides and sulphur dioxide in said flue gas are removed from said flue gas by said temperature reduction step and said first and second showers;

passing said flue gas through a sulfuric acid neutralizing liquid immediately after said second shower; and

discharging said flue gas to the atmosphere.

4,562,054

TREATMENT OF FLUE GAS

Vinay K. Bhatia, Copenhagen, Denmark, assignor to F. L. Smidth & Co. A/S, Denmark

Filed Jul. 25, 1984, Ser. No. 634,985

Claims priority, application Denmark, Jul. 29, 1983, 3485/83

Int. Cl.⁴ C01B *17/00*; B01J *8/00*

U.S. Cl. 423—244 **23 Claims**

1. In a dry method of removing sulfur oxides from hot flue gas, whereby an absorption agent in the form of a fine powder is introduced and dispersed in a stream of said hot flue gas in a tubular reaction chamber having a central vertical axis; said sulfur oxides are absorbed by and react with said absorption agent at a temperature within the range 500°–900° to produce a powder comprising reaction products and unreacted absorption agents suspended in said flue gas, and said powder is separated from said flue gas in a separate separating zone; the improvement involving introducing, dispersing and suspending said absorption agent selected from the group comprising oxides and hydroxides of calcium and magnesium, and oxides, hydroxides and carbonates of alkali metals in a rising swirling stream of said hot flue gas at a lower part of said reaction zone, introducing said hot flue gas axially at the bottom of said reaction zone as a stream which is subjected to a rapid reduction in axial velocity at said lower part of said reaction zone, and removing said resulting powder from an upper part of said reaction zone suspended in and entrained by said flue gas.

4,562,055

PROCESS FOR PREPARATION OF ZEOLITES

Junji Arika, Tokuyama; Hiroshi Miyazaki, Shinnanyo; Kazushige Igawa, Shinnanyo, and Keiji Itabashi, Shinnanyo, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shinnanyo, Japan

Filed Sep. 20, 1983, Ser. No. 534,118

Claims priority, application Japan, Oct. 8, 1982, 57-176077; Sep. 20, 1983, 57-162123

Int. Cl.⁴ C01B *33/28*

U.S. Cl. 423—329 **1 Claim**

1. A process for preparing a zeolite having an X-ray powder diffraction pattern with the lattice spacings (d-values) shown in Table 1, which process comprises the steps of:

(1) supplying an aqueous sodium silicate solution simultaneously and continuously with an aqueous aluminum-containing solution with stirring or agitation in an overflow reaction vessel such that the residence time of any portion of the reaction slurry in the reaction vessel is at least three minutes and the pH of the overflowing reaction slurry having the reaction product suspended therein is maintained at a value of 5 to 9 to obtain a slurry comprising a homogeneous phase compound of a granular amorphous aluminosilicate which is composed of, on the dry base, 1.2 Ato 5.9% by weight of aluminum calculated as anhydrous Al_2O_3, 1.4 to 3.9% by weight of sodium calculated as anhydrous Na_2O and the balance of silicon calculated as an hydrous SiO_2, and which is substantially spherical particles or an agglomerate of fine particles, said particles having a size of from 1 to 500 microns;

(2) subjecting said slurry to solid-liquid separation to obtain the granular amorphous aluminosilicate; and

(3) crystallizing said granular amorphous aluminosilicate at a temperature in the range of about 120° to 220° C. in an aqueous alkali solution selected from the group consisting of an aqueous sodium hydroxide solution and an aqueous sodium silicate solution, said aqueous alkali solution consisting of water, 1 to 5% by weight of sodium hydroxide and 0 to 10% by weight of SiO_2, the amount of said aqueous alkali solution being 20 to 2,000 parts by weight per 100 parts by weight of the granular amorphous aluminosilicate.

4,562,056

ELECTROCHROMIC MATERIAL AND LUBRICANT

Makoto Hottori, and Shoji Yamanaka, both of Hiroshima, Japan, assignors to Daicel Chemical Industries, Ltd., Sakai, Japan

Filed Apr. 9, 1984, Ser. No. 597,986

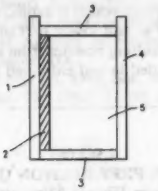
Claims priority, application Japan, Apr. 18, 1983, 58-68130; Jul. 22, 1983, 58-133779; Feb. 3, 1984, 59-18876

Int. Cl.⁴ C01B *21/02*

U.S. Cl. 423—351 **7 Claims**

1. A process for preparing a layered compound of beta-ZrNX, wherein X is chlorine, bromine or a solid solution of chlorine and bromine, which comprises the steps of (1) heating a solid zirconium material selected from the group consisting of (a) zirconium metal, (b) ZrH_X, wherein $0<x\leqq 2$, and (c) both zirconium metal and ZrH_X, to a temperature in the range

of from 400° to 800° C., and then (2) contacting same with gaseous ammonium chloride, gaseous ammonium bromide or



mixture thereof until said zironium material is converted to ZrNX.

4,562,057

PREPARATION OF LOW-CARBON VANADIUM NITRIDE

John B. Goddard, Grand Island, and Rodney F. Merkert, Buffalo, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 29, 1984, Ser. No. 594,664
Int. Cl.⁴ C01B *21/26*
U.S. Cl. 423—409 **14 Claims**

1. A process for producing low-carbon vanadium nitride comprising:

(a) providing a vanadium-containing oxidic compound selected from the group consisting of ammonium vanadates and oxides of vanadium;

(b) exposing said vanadium-containing oxidic compound to a reducing atmosphere containing a material selected from the group consisting of ammonia and mixtures of nitrogen and hydrogen, at an elevated temperature sufficient to partially reduce said vanadium-containing oxidic compound and yield a vanadium oxynitride material containing from about 3 to about 20 wt.% oxygen;

(c) blending said vanadium oxynitride material with a finely divided carbionaceous material in an amount such that the carbon blended in the mixture equals or exceeds the stoichiometric amount necessary to react with substantially all of the oxygen contained in said vanadium oxynitride material and to produce a vanadium nitride containing from about 2 to about 6 wt.% carbon; and

(d) subjecting the blended mixture formed in step (c) to a heat treatment in an inert or nitrogen-containing atmosphere or vacuum and at an elevated temperature sufficient to effect removal of oxygen from said vanadium oxynitride materiai and produce a substantially oxygen-free, low-carbon vanadium nitride material.

4,562,058

PROCESS FOR CRYSTALLIZING POTASSIUM SULFATE

William B. Dancy, Carlsbad, N. Mex., and Hsi Meng, Northbrook, Ill., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.

Continuation-in-part of Ser. No. 519,445, Aug. 2, 1983, abandoned. This application Mar. 25, 1985, Ser. No. 715,708
Int. Cl.⁴ C01D *15/06*; C01F *5/38*
U.S. Cl. 423—551 **6 Claims**

1. An improved process for the production of potassium sulfate crystals by the reaction of a saturated solution of potassium chloride with langbeinite in the solid phase at a temperature of from 45°–55° C., thereby forming potassium sulfate crystals and magnesium chloride solution comprising the step of conducting the reaction in the presence of from 1.2 to 2.4 kg per ton of langbeinite of a crystal growth enhancer consisting of from about 0.20 to 0.50 parts by weight of component (A) per part of component (B) wherein (A) is a mixture of neutralized alkylated diphenyloxide mono-sulfonic acid and a neutralized monosulfated fatty acid of 5 to 20 carbon atoms in a ratio of 1.66–20 parts of neutralized sulfated oleic acid per part of neutralized alkylated diphenyloxide monosulfonic acid and component (B) is a neutralized alkylated diphenyloxide disulfonic acid, wherein the acids are neutralized with sodium or potassium cations and the alkylated moiety of the diphenyloxide mono- or disulfonic acid is of from 10 to 14 carbon atoms and may be branched chain or straight chain or mixtures thereof.

4,562,059

METHOD OF PREPARING ALUMINA

Sachio Asaoka, Yokohama; Takashi Sendo, Machida, and Munekazu Nakamura, Yokohama, all of Japan, assignors to Chiyoda Chemical Engineering & Construction Co., Ltd., Yokohama, Japan

Filed Jun. 8, 1984, Ser. No. 618,698
Int. Cl.⁴ C01F *7/02, 7/34*
U.S. Cl. 423—626 **11 Claims**

1. In a method of preparing alumina, including forming an alumina hydrogel from seed aluminum hydroxide, and processing the alumina hydrogel for conversion into alumina, the improvement comprising the alumina hydrogel forming stage which comprises the steps of:

(a) providing an aqueous slurry containing seed aluminum hydroxide,

(b) mixing a pH controlling agent with the aqueous slurry to adjust the pH of the aqueous slurry to a value less than 5 or more than 11 and to dissolve fine crystallites of aluminum hydroxide contained in the aqueous slurry, said pH controlling agent being substantially free of aluminum salts, aluminates or ions which can form a precipitate during the alumina hydrogel forming stage, and

(c) then mixing an aluminum compound with the aqueous slurry to adjust the pH of the aqueous slurry to value in the range of from 6 to 11 and to cause the seed aluminum hydroxide to grow, the steps (b) and (c) being repeated in sequence more than once so that the seed aluminum hydroxide is caused to grow into the alumina hydrogel.

4,562,060

LOCAL ANESTHETIC MIXTURE FOR TOPICAL APPLICATION, PROCESS FOR ITS PREPARATION, AS WELL AS METHOD FOR OBTAINING LOCAL ANESTHESIA

Berndt F. J. Broberg, and Hans C. A. Evers, both of Södertälje, Sweden, assignors to Astra Lakemedel Aktiebolag, Sweden

Continuation of Ser. No. 411,624, Aug. 26, 1982, Pat. No. 4,529,601, which is a continuation of Ser. No. 963,811, Nov. 27, 1978, abandoned. This application Feb. 11, 1985, Ser. No. 684,458
Claims priority, application Sweden, Dec. 1, 1977, 7713618
Int. Cl.⁴ A61K *7/32, 9/12, 9/70*
U.S. Cl. 424—28 **2 Claims**

1. A locally active anesthetic agent comprising paper embedded with a homogeneous oil which is useful for topical application, consisting essentially of prilocaine in the form of its base in admixture with lidocaine, in the form of its base in a weight ratio of 42:58 to 80:20 such that the resulting mixture is a homogeneous oil which has a melting point of below 40° C.

4,562,061
PHARMACEUTICAL PREPARATION

Curt H. Appelgren, Kungsbacka; Conny B. Bogentoft, Kållered, and Gunnar H. Ekenved, Kungsbacka, all of Sweden, assignors to Aktiebolaget Hassle, Sweden

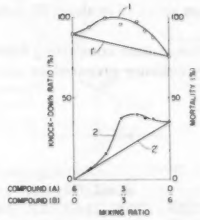
Continuation of Ser. No. 563,542, Dec. 20, 1983, abandoned, which is a continuation of Ser. No. 369,934, Apr. 19, 1982, abandoned. This application Mar. 27, 1985, Ser. No. 716,522
Claims priority, application Sweden, Apr. 27, 1981, 8102637
Int. Cl.[4] A61K *9/32, 9/36*
U.S. Cl. 424—32 2 Claims

1. An oral pharmaceutical preparation containing coated acetylsalicylic acid granules (ASA), said granules being coated with a polymeric coating which releases about 70 to 90% of the ASA after 2 hours at a pH of 6.5 to 7 wherein said coating is 5 to 12% by weight of the preparation and said coating comprises 60 to 45% by weight of the membrane of at least one polymer selected from the group consisting of cellulose acetate phtalate and methyl esterified methacrylic acid polymers having 45 to 55% esterification; 45 to 25% by weight of the membrane of at least one methyl esterified methacrylic acid polymer having 65 to 75% esterification and 4 to 12% by weight of the membrane of a plasticizer selected from a group consisting of fatty alcohols and fatty acids both having a straight saturated carbon chain containing 12 to 20 carbon atoms.

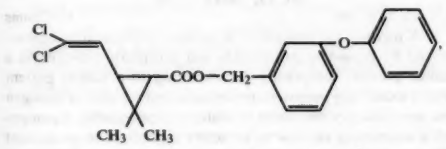
4,562,062
INSECTICIDAL COMPOSITION COMPRISING SYNERGISTIC COMBINATIONS OF 3-(2-METHOXYPHENYL)-5-METHOXY-1,3,4-OXADIAZOL-2(3H)-ONE AND PYRETHROID TYPE COMPOUNDS

Goro Shinjo, Toyonaka; Mitsuyasu Makita, Nishinomiya, and Shigenori Tsuda, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jun. 4, 1984, Ser. No. 617,031
Claims priority, application Japan, Jun. 10, 1983, 58-104533
Int. Cl.[4] A01N *43/82;* A61L *9/04*
U.S. Cl. 424—45 3 Claims



1. An insecticidal composition comprising 3-(2-methoxyphenyl)-5-methoxy-1,3,4-oxadizol-2(3H)-one and a pyrethroid type compound represented by the formula,



in a weight ratio of oxadiazol compound to pyrethroid compound being from 5:1 to 1:5.

4,562,063
ASTRINGENT GEL DENTIFRICE

Harry Hayes, Warrington, and Kenneth Harvey, Wilmslow, both of England, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Dec. 11, 1984, Ser. No. 680,426
Int. Cl.[4] A61K *7/16*
U.S. Cl. 424—49 10 Claims

1. An astringent gel dentifrice comprising about 20–90% by weight of liquid vehicle comprising water in amount of at least about 3% by weight of said dentifrice, about 0.05–5% by weight of an alkali metal carboxymethyl cellulose gelling agent and about 10–50% by weight of a polishing agent comprising a synthetic precipitated, amorphous silica gel having an average particle size of 1 to 30 microns and
(a) a surface area of 1 to 600 m^2/g,
(b) a pore volume of 0.05 to 0.5 cm^3/g,
(c) a product of surface area (in m^2/g)×pore volume (in cm^3/g) less than or equal to 240,
(d) a calculated pore diameter of 1.5 to 2.5 nm, and
(e) a water content of less than 25% by weight;
and up to about 5% of a water-soluble zinc salt which provides at least about 50 ppm of zinc ions to said dentifrice.

4,562,064
STABILIZING OF CINNAMIC ALDEHYDE-CONTAINING FLAVORS WITH TERPENES AND SESQUETERPENES

Robert J. Steltenkamp, Somerset; Miriam L. Douglass, and Gerard E. Natarelli, both of Piscataway, all of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Feb. 9, 1984, Ser. No. 578,457
Int. Cl.[4] A61K *7/16, 7/26*
U.S. Cl. 424—49 17 Claims

1. A white dentifrice formulation having improved stability against yellowing discoloration upon aging, comprising about 0.1–1% by weight of an unsaturated aldehyde-containing flavorant selected from the group consisting of cinnamic aldehyde and citral, which is subject to discoloration with aging, and about 0.1–5% by weight of at least one terpene or sesquiterpene containing trisubstituted double bonds effective to impart color stability against aging, in a dental vehicle free of oxidizing agents and having a slightly acid to alkaline pH below 8.5.

4,562,065
ASTRINGENT DENTIFRICE

Harry Hayes, Thelwall, and Kenneth Harvey, Wilmslow, both of England, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Dec. 11, 1984, Ser. No. 680,425
Int. Cl.[4] A61K *9/16*
U.S. Cl. 424—49 10 Claims

1. An astringent dentifrice comprising about 20–90% by weight of liquid vehicle comprising water in amount of at least about 3% by weight of said dentifrice, about 0.5–5% by weight of a gelling agent and about 10–50% by weight of a polishing agent comprising a synthetic precipitated, amorphous silica gel having an average particle size of 1 to 30 microns and
(a) a surface area of 1 to 600 m^2/g,
(b) a pore volume of 0.05 to 0.5 cm^3/g,
(c) a product of surface area (in m^2/g)×pore volume (in cm^3/g) less than or equal to 240,
(d) a calculated pore diameter of 1.5 to 2.5 nm and
(e) a water content of less than 25% by weight; and
up to about 5% of a water-soluble zinc salt which provides at least about 50 ppm of zinc ions to said dentifrice.

4,562,066

ASTRINGENT DENTIFRICE CONTAINING MONOFLUOROPHOSPHATE

Harry Hayes, Warrington, and Kenneth Harvey, Wilmslow, both of England, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Dec. 11, 1984, Ser. No. 680,424
Int. Cl.[4] A61K 7/16, 7/18
U.S. Cl. 424—52 12 Claims

1. An astringent dentifrice comprising about 20–90% by weight of liquid vehicle comprising water in amount of at least about 3% by weight of said dentifrice, about 0.05–5% by weight of a gelling agent and about 10–50% by weight of a polishing agent comprising a synthetic precipitated, amorphous silica gel having an average particle size of 1 to 30 microns and

(a) a surface area of 1 to 600 m^2/g,

(b) a pore volume of 0.05 to 0.5 cm^3/g,

(c) a product of surface area (in m^2/g)×pore volume (in cm^3/g) less than or equal to 240,

(d) a calculated pore diameter of 1.5 to 2.5 nm, and

(e) a water content of less than 25% by weight; up to about 5% of a water-soluble zinc salt which provides at least about 50 ppm of zinc ions to said dentifrice and an alkali metal monofluorophosphate in amount to provide about 0.01–1% fluoride.

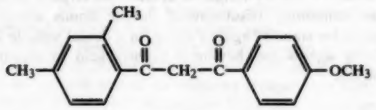
4,562,067

PREPARATION OF NOVEL DIBENZOYLMETHANE DERIVATIVE SUNSCREEN AGENTS

Rudolf Hopp; Horst Finkelmeier, both of Holzminden, and Roland Langner, Bevern, all of Fed. Rep. of Germany, assignors to Haarmann & Reimer GmbH, Holzminden, Fed. Rep. of Germany

Filed Jan. 12, 1984, Ser. No. 570,138
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1983, 3302123
Int. Cl.[4] A61K 7/42; C07C 49/84
U.S. Cl. 424—59 6 Claims

1. 2,4-Dimethyl-4'-methoxydibenzoylmethane of the formula



2. A sunscreen composition comprising a sunscreen base and a sun-screening effective amount of a dibenzoylmethane derivative according to claim 1.

4,562,068

SEBOSUPPRESSIVE COSMETIC PREPARATIONS CONTAINING ARYLOXOBUTENOIC ACID DERIVATIVES

Hinrich Möller, and Siegfried Wallat, both of Monhein, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Jan. 18, 1983, Ser. No. 458,963
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1982, 3228842
Int. Cl.[4] A61K 7/06
U.S. Cl. 424—70 7 Claims

1. A method for treating oily hair or seborrhea which comprises administering to an individual in need of such treatment a sebosuppressively effective amount of one or more compounds of the formula

Ar—CO—CH=CH—CO—X (I)

wherein

Ar represents an optionally substituted aromatic or heteroaromatic group; and

X represents an alkoxy group having from 1 to 10 carbon atoms, an amino group optionally substituted by one or more aryl or alkyl groups having from 1 to 6 carbon atoms, or a nitrogen atom-containing heterocycle.

4,562,069

TWO-PHASE FORMULATION

Ahmed Hegasy, Leverkusen; Roland Rupp, Leichlingen; Klaus-Dieter Rämsch, Wuppertal, and Helmut Luchtenberg, Niederkassel, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 2, 1984, Ser. No. 606,104
Claims priority, application Fed. Rep. of Germany, May 21, 1983, 3318649
Int. Cl.[4] A61K 31/79, 31/455, 47/00
U.S. Cl. 424—80 9 Claims

1. A solid two-phase medicament formulation comprising a nifedipine coprecipitate, in which the nifedipine is present in a non-crystalline form, and crystalline nifedipine.

4,562,070

METHOD OF ENHANCEMENT OF PILIATED PHASE OF BORDETELLA BRONCHISEPTICA

Sarah W. Wood, Pittsburgh, Pa., assignor to Bactex Corporation, Pittsburgh, Pa.

Filed Aug. 31, 1983, Ser. No. 528,218
Int. Cl.[4] A61K 39/02
U.S. Cl. 424—92 4 Claims

1. A process for enhancing a prevalence of phase stable colonies of the piliated phase of *Bordetella bronchiseptica* which comprises growing organisms from a source selected from the group consisting of piliated organisms, unpiliated organisms and mixtures thereof on a growth medium suitable for growth of said organisms at a temperature of 35° to 38° C. for 1 to 4 days, reducing the environmental temperature to between 20° and 27° C. for from about 15 to about 20 days until papillae are noted.

4. A vaccine composition comprising formaldehyde treated cells grown from colonies prepared in accordance with the process of claim 1.

4,562,071

METHOD OF TREATING DIABETIC NEPHROPATHY

Yutaka Tokumori, Yonago; Osamu Mokuda, Hyogo; Tadasu Ikeda, Yonago; Akira Takeda, Yonago; Masato Tominaga, Yonago, and Hiroto Mashiba, Yonago, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed May 26, 1983, Ser. No. 498,237
Claims priority, application Japan, May 28, 1982, 57-89808
Int. Cl.[4] A61K 37/48
U.S. Cl. 424—94 11 Claims

1. A method for treatment of diabetic nephropathy characterized by persistent proteinuria and serumuria nitrogen in a human patient, comprising administering to a human patient who is exhibiting persistent proteinuria and serumuria nitrogen that are clinically indicative of diabetic nephropathy, a composition containing elastase as an active ingredient in an amount effective to reduce the level of urinary protein excretion and serumuria nitrogen, in combination with a pharmacologically acceptable carrier, diluent, or vehicle.

4,562,072

PROCESS FOR THE PASTEURIZATION OF ANTIHEMOPHILIC CRYOPRECIPITATE (AHC) AND ANTIHEMOPHILIC CRYOPRECIPITATE PREPARED THEREBY

Norbert Heimburger, Marburg; Gerhardt Kumpe, Wetter; Wilfried Wormsbächer, Kirchhain, and Hans M. Preis, Marburg, all of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg, Fed. Rep. of Germany

Filed Oct. 7, 1983, Ser. No. 540,172

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1982, 3237512

Int. Cl.[4] A61K *35/16*

U.S. Cl. 424—101 6 Claims

1. A process for the pasteurization of antihemophilic cryoprecipitate (AHC), which comprises heating a solution of AHC in the presence of effective amounts of Ca ions, an amino acid and a monosaccharide or oligosaccharide or sugar alcohol for a time sufficient to inactivate hepatitis virus in said solution of AHC wherein said Ca ions are present in a concentration of about 0.2 mmol. to about 100 mmol. per liter and wherein said Ca ions, amino acid, and monosaccharide or oligosaccharide or sugar alcohol are present in effective amounts such that the pasteurized antihemophilic cryoprecipitate (AHC) is substantially free of fibrinogen polymers.

5. Antihemophilic cryoprecipitate prepared by the method of one of claims 1 and 2-4 and containing soluble fibrinogen and fibronectin; and being substantially free of fibrinogen polymers.

4,562,073

PENICILLIN DERIVATIVES

Ronald G. Micetich, Alberta, Canada; Shigeru Yamabe, Kobe, Japan; Motoaki Tanaka, Tokushima, Japan; Makoto Kajitani, Tokushima, Japan; Tomio Yamazaki, Tokushima, Japan, and Naobumi Ishida, Tokushima, Japan, assignors to Taiho Pharmaceutical Company Limited, Tokyo, Japan

Filed Aug. 1, 1983, Ser. No. 519,491

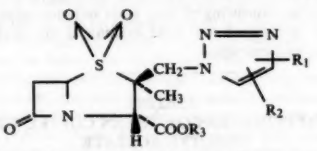
Claims priority, application Japan, Dec. 24, 1982, 57-233967; Feb. 10, 1983, 58-21200

The portion of the term of this patent subsequent to Jul. 16, 2002, has been disclaimed.

Int. Cl.[4] C07D *499/00;* A61K *31/425*

U.S. Cl. 424—114 18 Claims

1. A penicillin derivative represented by the following formula



wherein R_1 is hydrogen or trialkylsily; R_2 is hydrogen, trialkylsilyl or $COOR_2'$ wherein R_2' is hydrogen, C_{1-18} alkyl, C_{2-7} alkoxymethyl, C_{3-8} alkylcarbonyloxymethyl, C_{4-9} alkylcarbonyloxyethyl, (C_{5-7} cycloalkyl)carbonyloxymethyl, C_{9-14} benzylcarbonyloxyalkyl, C_{3-8} alkoxycarbonylmethyl, C_{4-9} alkoxycarbonylethyl, phthalidyl, crotonolacton-4-yl, γ-butyrolacton-4-yl, halogenated C_{1-6} alkyl substituted with 1 to 3 halogen atoms, C_{1-6} alkoxy- or nitro-substituted or unsubstituted benzyl, benzhydryl, tetrahydropyranyl, dimethylaminoethyl, dimethylchlorosilyl, trichlorosilyl, (5-substituted C_{1-6} alkyl or phenyl or unsubstituted-2-oxo-1,3-dioxoden-4-yl)methyl, C_{8-13} benzoyloxyalkyl or group for forming a pharmaceutically acceptable salt; and R_3 has the same meaning as above R_2'.

4,562,074

Patent Not Issued For This Number

4,562,075

PENETRATION ENHANCERS FOR TRANSDERMAL DRUG DELIVERY OF SYSTEMIC AGENTS

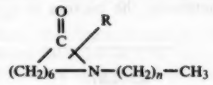
Vithal J. Rajadhyaksha, Mission Viejo, Calif., assignor to Nelson Research & Development Co., Irvine, Calif.

Division of Ser. No. 380,161, May 20, 1982, Pat. No. 4,405,616, which is a continuation-in-part of Ser. No. 260,201, May 4, 1981, abandoned, which is a continuation of Ser. No. 725,490, Oct. 28, 1976, abandoned, which is a continuation-in-part of Ser. No. 588,247, Jul. 19, 1975, Pat. No. 3,989,816. This application Jul. 25, 1983, Ser. No. 517,131

Int. Cl.[4] A61U *31/33*

U.S. Cl. 514—788 10 Claims

1. A method for administering a systemically active agent, comprising the step of applying a transdermal device or formulation to the skin or mucosal membrane of a human or animal said device or formulation containing a systemically active agent and an effective amount of a membrane penetration enhancer having the structural formula



where R is H or a lower alkyl group having 1–4 carbon atoms and n is 0–17, to deliver the systemically-active agent through the skin or mucosal membrane.

4,562,076

CHEWING GUM WITH COATING OF THAUMATIN OR MONELLIN AND METHOD

Todd W. Arnold, White Pidgeon, Mich., and Mansukh M. Patel, Villa Park, Ill., assignors to Wm. Wrigley Jr. Company, Chicago, Ill.

Continuation-in-part of Ser. No. 453,274, Dec. 27, 1982, abandoned. This application Dec. 1, 1983, Ser. No. 556,092

Int. Cl.[4] A23G *3/30*

U.S. Cl. 426—5 34 Claims

1. A chewing gum composition having a core portion comprising chewable gum base, sweetener and flavoring, and further having deposited on the surface of said the core portion, a rolling compound comprising a sweet protein selected from the group consisting of thaumatin and monellin, the protein constituting at least 0.5 but less than 100 ppm by weight of the chewing gum composition.

4,562,077

METHOD FOR CONVERTING MALIC ACID TO LACTIC ACID IN WINE

Stephen W. King, Sarasota, Fla., assignor to Microlife Technics, Inc., Sarasota, Fla.

Filed Oct. 19, 1983, Ser. No. 543,347

Int. Cl.[4] C12G *1/00;* C12P *7/56;* C12N *1/36, 1/20*

U.S. Cl. 426—13 11 Claims

1. A method for the reduction of malic acid to lactic acid in wine which comprises:

(a) growing in a growth medium containing malic acid and a nitrogen source a bacterial culture that converts malic acid to lactic acid in wine, and thereafter concentrating the bacterial culture to produce a lyophilized culture concentrate or a frozen culture concentrate containing between about 10^8 and 10^{13} cells per gram or per milliliter of concentrate;

(b) inoculating the lyophilized culture concentrate or the frozen culture concentrate after thawing into fruit juice containing a nitrogen source to provide about 10^7 to 10^{10} bacterial cells per milliliter of the fruit juice and holding the inoculated fruit juice for 48 to 72 hours at 18° C. 25°C., such that the cell population of the bacteria does not significantly increase in number in the fruit juice, to acti-

vate the bacteria and produce a mixture of the activated bacteria and the fruit juice; and

(c) introducing the mixture of activated bacteria and fruit juice into wine or grape must contain malic acid to provide a concentration of at least about 10^5 bacterial cells per milliliter of wine or grape must and converting the malic acid to lactic acid with the bacteria to produce wine having a reduced malic acid content.

4,562,078

PROCESS OF MANUFACTURING BARM FOR BAKERY AND PASTRY PRODUCTS

Rikiichi Kizawa, Houya, and Shinji Ishigami, Tokyo, both of Japan, assignors to Nisshin Flour Milling Co., Ltd., Japan

Filed Jun. 21, 1983, Ser. No. 506,299

Claims priority, application Japan, Jun. 30, 1982, 57-111658

Int. Cl.[4] A21D *2/00;* **A23L** *1/28;* **C12G** *3/08*

U.S. Cl. 426—52 **2 Claims**

1. Process of manufacturing barm for bakery and pastry products which comprises mixing alcohol-freed beer solution with Koji and incubating the mixture at a temperature of 20°–30° C.

4,562,079

HARD BUTTER SAVORY COATINGS

Anthony G. Herzing, Brookpark, Ohio, assignor to SCM Corporation, New York, N.Y.

Filed Feb. 6, 1984, Ser. No. 577,393

Int. Cl.[4] A21D *13/00*

U.S. Cl. 426—94 **17 Claims**

1. A hard non-chocolate savory coating which has the appearance and texture of a confectionery coating, a chewy texture, which can be applied to a substrate, and which has a recognizable but delicate flavor of a meat, vegetable, fish or fowl food group, or combination of such food groups, comprising

(a) about 25–50%, based on total composition weight, of a hard butter having a Wiley Melting Point in the range of about 84°–120° F.;

(b) a flavoring amount of a flavoring material selected from the group consisting of meat flavor, vegetable flavor, fish flavor, fowl flavor, and combinations thereof;

(c) an inert particulate, bland base in said hard butter selected from the group consisting of protein, carbohydrate, and combinations thereof, at least about 15% of said base being lactose, whey or a blend thereof;

said hard butter, flavoring material and base being milled or refined and conched, in the absence of water, in order to reduce base particle size and completely wet the base particles with hard butter to thereby produce said confectionery coating texture.

4,562,080

FRUIT FILLER FOR PASTRY PRODUCTS AND PROCESS FOR ITS PREPARATION

Faozy E. Tenn, Patterson, N.J., assignor to Nabisco Brands, Inc., Parsippany, N.J.

Filed Jul. 26, 1984, Ser. No. 634,767

Int. Cl.[4] A21D *13/00, 13/08;* **A23G** *3/00*

U.S. Cl. 426—94 **30 Claims**

1. Edible heat-stable fruit filling for incorporation within a pastry dough sheath comprising:

(a) about 60 to about 76 weight percent of corn syrup containing a substantial amount of fructose;

(b) about 10 to about 18 weight percent of apple powder;

(c) about 2 to about 7 weight percent of pregelatinized tapioca starch; and

(d) the remainder being at least one fruit in concentrated juice or concentrated puree form, the weight ratios of said corn syrup, said apple powder, said pregelatinized tapioca starch and said fruit being such as to provide heat resistance to the fruit filling and to provide stability to the filling, "the weight ratio of said corn syrup to said apple powder being between about 3 to 1 and about 7 to 1, the weight ratio of said corn syrup to said apple powder being between about 4.5 to 1 and about 6.5 to 1, the weight ratio of said apple powder to said pregelatinized tapioca starch being between 2:1 and 6:1, the fruit filling having an equilibrium relative humidity of 70 percent or less, the fruit filling having a moisture content of about 22 to about 25 weight percent of water, the fruit filling having a soluble solids content of 73 to 80 weight percent, and the fruit filling not containing any crystalline sugar or containing only up to 5 weight percent of sugar.

4,562,081

METHOD OF MAKING AN ICE CREAM SUNDAE

Garry G. Buttermann, III, 7704 Briarwood Dr., Crestwood, Ky. 40014

Filed Apr. 13, 1984, Ser. No. 600,167

Int. Cl.[4] A23G *9/00, 9/24*

U.S. Cl. 426—101 **20 Claims**

7. A method of making an ice cream sundae comprising the steps of:

adding ice cream to a container; and,

pumping a topping onto said ice cream, said topping having a viscosity of from about 4 to about 12 Bostwick units, and solids of from about 40 to about 50 percent by weight of said topping.

4,562,082

EXTRUDED SHRIMP ANALOG FORMED FROM VEGETABLE PROTEIN AND STARCH COMPLEX

Keisuke Morimoto, Congers, N.Y., assignor to General Foods Corporation, White Plains, N.Y.

Filed Mar. 15, 1984, Ser. No. 589,624

Int. Cl.[4] A23J *3/00*

U.S. Cl. 426—104 **14 Claims**

1. A fibrous extrudate of improved shrimp-like firmness and elasticity formed from a composition which comprises: water from about 15 to about 35 weight percent, heat coagulable vegetable protein from about 57 to about 77 weight percent, other heat coagulable protein from 0 to about 20 weight percent, non-heat coagulable protein from 0 to about 30 percent, amylose containing starch from about 4 to about 15 weight percent and a complex forming lipid from about 0.2 to about 2 weight percent; wherein said complex forming lipid is selected from the group consisting of fatty acids and monoglycerides of fatty acids said starch and lipid existing as an amylose-lipid complex in said extrudate.

4,562,083

DECAFFEINATION OF GREEN COFFEE WITH N-BUTYL ACETATE

Martin Gottesman, Paramus, N.J., assignor to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 166,647, Jul. 7, 1980, abandoned. This application Nov. 19, 1984, Ser. No. 710,357

Int. Cl.[4] A23F *5/20, 5/22*

U.S. Cl. 426—424 **8 Claims**

1. A method of decaffeinating green coffee which comprises:

(a) moistening green coffee,

(b) contacting the moistened green coffee with n-butyl acetate for a period of time effective for transferring caffeine from the coffee to the n-butyl acetate, and

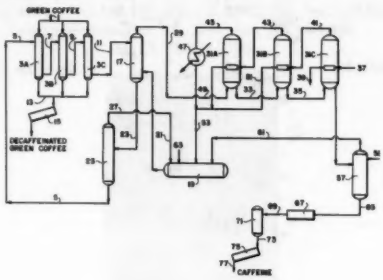
(c) separating the n-butyl acetate from the decaffeinated green coffee.

5. A method of decaffeinating green coffee which comprises:

(a) contacting green coffee with a decaffeinated aqueous extract of green coffee for a period of time effective for transferring caffeine from the coffee to the aqueous extract,

(b) separating the aqueous extract from the decaffeinated green coffee,

(c) contacting the caffeine-containing aqueous extract of step (b) with n-butyl acetate for a period of time effective for transferring caffeine from the caffeine-containing aqueous extract to the n-butyl acetate,



(d) steam stripping the aqueous extract to remove residual solvent, and

(e) recycling the decaffeinated aqueous extract of step (c) to step (a).

4,562,084

METHOD FOR FEEDING COOKIE PREFORMS

Harris B. McKee, Dallas, Tex., assignor to Frito-Lay, Inc., Dallas, Tex.

Filed Jun. 22, 1984, Ser. No. 623,706
Int. Cl.⁴ A21C *11/06*; A21D *8/02*
U.S. Cl. 426—502 **1 Claim**

1. A method of feeding cookie preforms to a bakery oven via conveyor belts which maximizes oven space and conveyor belt utilization, the method comprising:

(a) extruding onto a first conveyor belt moving in the direction of said oven a plurality of parallel ribbons of cookie dough extrudate, the distance between the edges of each adjacent ribbon being about equal to the amount of directional expansion of the cookie dough upon baking;

(b) cutting each ribbon in a direction perpendicular to the direction of ribbon travel to form individual cookie preforms as the ribbon progresses, the cuts in each ribbon being in phase with the cuts on alternating parallel ribbons and out of phase with the cuts on adjacent parallel ribbons by a distance of about one-half the length of a cookie preform;

(c) feeding the individual cookie preforms from the first conveyor belt onto a second conveyor belt which moves toward and passes into the oven at a linear speed about twice that of the first conveyor belt, thereby separating each individual cookie preform from the preceding and following cookie preforms by a distance of about the length of one cookie preform, and thereby forming, in the direction of travel, parallel, staggered rows of individual cookie preforms on said second conveyor belt.

4,562,085

PRODUCTION OF FRUIT PRESERVES

Frank J. Ruggiero, Stroudsburg, Pa., assignor to Alfa-Laval, Inc., Poughkeepsie, N.Y.

Filed Oct. 9, 1984, Ser. No. 658,530
Int. Cl.⁴ A23L *1/06*
U.S. Cl. 426—577 **9 Claims**

1. A process for the production of a fruit preserve, which comprises the steps of slowly agitating a blend of about 50% fruit and 41.50% sugar, adding to said blend a water solution of pectin to form a premix having about 8.0 to 9.1% of pectin, heating a stream of said premix to a temperature of 90°–125° F. during gentle agitation of the premix, then adding a sufficient amount of a citric acid solution to the premix, to obtain a concentration of about 1.5% citric acid in the premix, then heating a stream of the resulting mixture to a temperature of 135°–145° F. during gentle agitation thereof, then passing said mixture through an evaporation zone at a temperature of 145°–160° F. under a vacuum of 20–27" Hg while gently agitating the mixture for a period of time sufficient to obtain a concentrated product, heating a stream of said product to a sterilizing temperature in the range of 190°–205° F. during gentle agitation thereof, and then passing the product through a holding zone for 8 seconds to 3 minutes while at a temperature of 185°–205° F. to provide said fruit preserve.

4,562,086

MODIFIED STARCH, ITS METHOD OF MANUFACTURE AND THE SALAD DRESSINGS PRODUCED THEREWITH

George E. Smolka, Crown Point, and Richard J. Alexander, Dyer, both of Ind., assignors to American Maize-Products Company, Hammond, Ind.

Filed Feb. 6, 1984, Ser. No. 577,253
Int. Cl.⁴ A23L *1/24, 1/195, 1/10*
U.S. Cl. 426—578 **9 Claims**

1. A cross-linked, etherified common starch having a degree of substitution about 2.0 to about 3.5% with ether groups and having a shear resistance value about 40 to about 80%, shear resilience value about 70 to about 100% and gel strength value about 5.0 to about 32.0 ml.

4,562,087

GRAPEFRUIT JUICE AND PROCESS FOR PREPARING SAME

Allen C. Kryger, Holland, Mich., assignor to Squirt & Company, Holland, Mich.

Filed Jun. 11, 1984, Ser. No. 619,781
Int. Cl.⁴ A23L *2/02*
U.S. Cl. 426—599 **12 Claims**

1. An improved grapefruit juice comprising a reconstituted grapefruit juice having:

from about 0.007 to about 0.015% by weight based on said juice of a mixture of grapefruit essence oil and five-fold grapefruit peel oil in a ratio of from about 70/30% by weight to about 80/20% by weight of said essence oil to said peel oil;

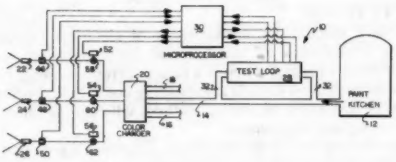
said essence oil and said peel oil being selected to provide the final product with from about 0.000096 to about 0.00018% by weight nootkatone and from about 0.000015 to about 0.000037% by weight linalool, both based on said final juice product.

4,562,088

PROCESS AND APPARATUS FOR MAINTAINING A CONSTANT FLOW RATE IN A PAINTING SYSTEM

Richard R. Navarro, North Olmsted, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed Jun. 6, 1984, Ser. No. 617,690
Int. Cl.⁴ B05D *1/02*; B05C *5/00*
U.S. Cl. 427—8 **15 Claims**



1. In a painting system having a source of coating material in communication through a first conduit with a spray nozzle for spray coating the coating material onto a work piece, an apparatus for maintaining a constant flow rate of the coating material from the spray nozzle, comprising:

a first temperature sensor in the first conduit adjacent the spray nozzle, presenting a first output signal corresponding to the temperature of the coating at the nozzle;

a first pressure regulator in the first conduit adjacent the spray nozzle, for regulating the pressure at which the coating is delivered to the spray nozzle;

first means interposed in the conduit for determining the relationship between temperature and pressure of the coating relative to the flow rate of the coating and presenting a second output signal representative of said relationship; and

second means interconnected with said first temperature sensor and said first pressure regulator for receiving said first and second output signals and for regulating said first pressure regulator as a function of said output signals to maintain a constant flow rate of the coating from the nozzle.

14. A process for maintaining a fixed mass flow rate of coating from a spray nozzle comprising the steps of:

determining the relationship between temperature and pressure for the coating to maintain a constant flow rate by:

measuring a reference temperature T_0 and reference pressure P_0 of the coating for a flow rate value;

heating the coating to temperature T_1 different than T_0;

adjusting the pressure applied to the coating to return to said flow rate value;

measuring the new temperature T_1, and new pressure P_1 of the coating; and

determining the sensitivity factor b of the coating according to the equation

$$b = \frac{\ln(P_1/P_0)}{T_0 - T_1};$$

sensing an initial temperature of the coating at the spray nozzle, at which initial temperature T_i a desired mass flow rate of coating is attained from the spray nozzle at an initial pressure P_i; and

periodically sensing the temperature of the coating at the spray nozzle to detect the existence of a new temperature T_f; and

wherein pressure at the nozzle is adjusted to a new pressure P_f to maintain a constant mass flow rate according to said equation;

$$P_f = P_i e^{b(Ti - Tf)}$$

where T_i and P_i are respectively said initial temperature and pressure and T_f and P_f are respectively said new temperature and pressure.

4,562,089

METHOD OF MEASURING ELECTRIC RESISTANCE OF THIN METALLIC LAYERS MANUFACTURED UNDER THE INFLUENCE OF A PLASMA

Konrad Hieber, Bernau, and Norbert Mayer, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 22, 1984, Ser. No. 663,760

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1983, 3340719

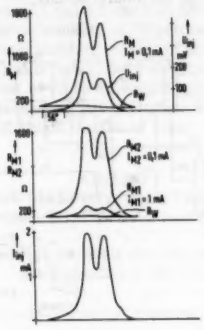
Int. Cl.⁴ C23C *15/00*

U.S. Cl. 427—10 **12 Claims**

1. In a method for measurement of electrical resistance during manufacture of thin metallic films produced under influence of a plasma, wherein a direct current or ohmic resistance measurement is made at measuring contacts according to a two or four-point measuring method, wherein the improvement comprises the steps of:

determining one of the parameters resistance R_M or voltage drop U_M over at least a portion of the film given at least one measuring or test current I_M; and

measuring a voltage U_{inj} dropping across at least the portion of the film at the measuring contacts when no measuring or test current I_M is sent through the film while it is under the influence of the plasma during the manufacture of the film and at a time close to a time when the measuring or test current I_M is applied, the two measuring times lying within a time interval of 0.01 to 1 second, whereby an



effect on the measurement by current injected by the plasma is determined.

4,562,090

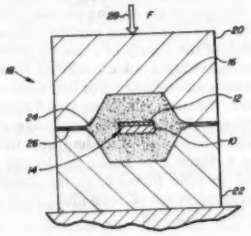
METHOD FOR IMPROVING THE DENSITY, STRENGTH AND BONDING OF COATINGS

James Dickson, Stirling, N.J., and Charles Hays, Pearland, Tex., assignors to Gray Tool Company, Houston, Tex.

Filed Nov. 30, 1983, Ser. No. 556,291

Int. Cl.⁴ B05D *1/08, 3/12*

U.S. Cl. 427—34 **18 Claims**



1. A method for improving the density and bonding of a coating which has been previously applied to a substrate comprising the steps of:

(a) heating the coating to a temperature above 0.5 T_i, where T_i is the incipient melting temperature of the coating;

(b) contacting the coated substrate with a pressure transfer medium, said pressure transfer medium being viscoelastic at the temperature to which the coating is heated;

(c) enclosing the coated substrate and said pressure transfer medium in a die; and

(d) applying a force to said die sufficient to cause a compressive stress greater in magnitude than 30 ksi to be applied through said pressure transfer medium and directly transmitted to said coated substrate.

4,562,091

USE OF PLASMA POLYMERIZED ORGAOSILICON FILMS IN FABRICATION OF LIFT-OFF MASKS

Harbans S. Sachdev, and Krishna G. Sachdev, both of Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 452,549, Dec. 23, 1982, Pat. No. 4,493,855. This application Dec. 18, 1984, Ser. No. 668,360

Int. Cl.[4] B05D *3/06*

U.S. Cl. 427—41 4 Claims

1. A method of depositing a layer on a monocrystalline silicon substrate comprising:

A. forming on a portion of said substrate a film by plasma polymerizing said film from an ambient containing monomers selected from the group consisting of organosilicons, including organosilanes, organosilazanes, organosiloxanes, and mixtures thereof;

B. heat treating said film at a temperature between about 85° C. and about 400° C.; and

C. treating said film in an oxygen plasma.

4,562,092

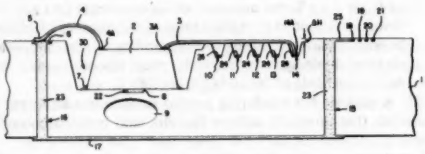
METHOD OF FABRICATING COMPLEX MICROCIRCUIT BOARDS, SUBSTRATES AND MICROCIRCUITS AND THE SUBSTRATES AND MICROCIRCUITS

Raymond E. Wiech, Jr., San Diego, Calif., assignor to Fine Particle Technology Corporation, Camarillo, Calif.

Continuation of Ser. No. 445,017, Nov. 29, 1982, abandoned, which is a continuation-in-part of Ser. No. 174,929, Aug. 4, 1980, Pat. No. 4,374,457. This application Oct. 30, 1984, Ser. No. 665,507

Int. Cl.[4] H05K *3/12;* B05D *5/12, 1/28*

U.S. Cl. 427—58 8 Claims



1. A method of forming a predetermined pattern on a substrate comprising the steps of:

(a) providing a three dimensional substrate in green form composed of homogeneously dispersed binder and sinterable powder in a predetermined shape,

(b) providing a homogeneous composition composed of a thermoplastic material and a sinterable material inert with respect to said substrate and adherable to said substrate,

(c) providing a pattern of predetermined shape wettable by said composition when said composition is in the liquid state,

(d) wetting said pattern with said composition,

(e) placing the composition on said pattern on a predetermined location on said substrate,

(f) cooling said composition on said substrate to cause said composition to set,

(g) removing said thermoplastic material and at least a portion of said binder, and

(h) simultaneously sintering said sinterable material and said sinterable powder to provide a sintered substrate of said sinterable powder with said sinterable material adhered thereto.

4,562,093

PROCESS FOR THE PRODUCTION OF GLASS PANES HAVING A GLARE PROTECTION FILTER AND APPARATUS FOR CARRYING OUT THE PROCESS

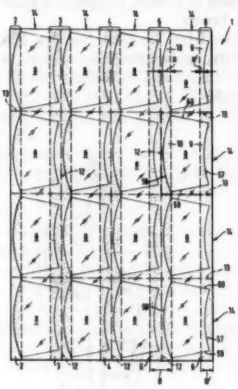
Roth Mario, Aachen, and Termath Günther, Gelsenkirchen, both of Fed. Rep. of Germany, assignors to Saint-Gobain Vitrage, Aubervilliers, France

Filed Oct. 29, 1984, Ser. No. 666,030

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1983, 3339334; Jan. 12, 1984, 3400843

Int. Cl.[4] C23C *14/00;* B05D *5/12, 5/06;* B05B *5/00*

U.S. Cl. 427—109 25 Claims



1. A process for the production of a glass pane for use in a vehicle wherein said glass pane has a band filter along at least one marginal edge, said process being characterized by providing continuous relative movement between a glass sheet and means within a chamber for depositing a coating material on said glass sheet, said glass sheet being of a size which may be subdivided into a plurality of blanks from which individual glass panes are cut, forming said deposit of coating material in a family of filter strips disposed in side-by-side relation and extending continuously in one direction along said glass sheet, and subdividing sheet whereby parts of the continuous filter strips comprise ultimately said at least one band filter along a marginal edge of said glass pane.

16. Apparatus for use in the production of a glass pane capable of use in a vehicle wherein said glass pane has a filter strip along at least one marginal edge comprising a conveyor for conveying a glass sheet including said glass pane horizontally along a path providing therealong at least one chamber and an adjoining sluice chamber through which said glass sheet is conveyed, each of said chambers being subject to vacuum conditions, and characterized by a sputter electrode disposed

in said chamber, said sputter electrode being disposed transverse to the direction of movement of said glass sheet, said sputter electrode being operative to form said filter strips of said family of filter strips on said glass sheet.

4,562,094

METHOD OF MANUFACTURING POROUS CARBON STRUCTURES

Franz Goebel, Sudbury; Timothy B. Haskins, Concord, and David C. Batson, Melrose, all of Mass., assignors to GTE Government Systems Corporation, Stamford, Conn.

Filed Apr. 3, 1985, Ser. No. 719,598
Int. Cl.[4] B05D *5/12, 3/02*
U.S. Cl. 427—115 **1 Claim**

1. A method of manufacturing porous carbon structures comprising the steps of:

a. suspending particulate carbon and tetrafluoroethylene in liquid trichlorotrifluoroethane to form a slurry;

b. depositing a layer of said slurry on a substrate; and

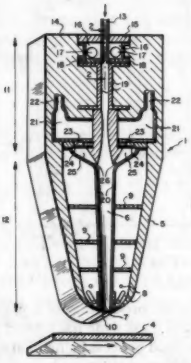
c. evaporating said trichlorotrifluoroethane from said layer leaving a porous residue of carbon and tetrafluoroethylene adhered to said substrate.

4,562,095

METHOD AND APPARATUS FOR MANUFACTURING A UNIFORMLY COATED SUBSTRATE

Jean-Claude Coulon, Mercurey, and Jean-Pierre Douche, Thourotte, both of France, assignors to Saint Gobain Vitrage, Courbevoie, France

Filed Mar. 12, 1984, Ser. No. 588,329
Claims priority, application France, Mar. 14, 1983, 83 04124
Int. Cl.[4] B05D *1/06*
U.S. Cl. 427—180 **43 Claims**



1. A method for regularly distributing a powder onto a substrate comprising the steps of:

forming a sheet-like stream of powder suspended in a gas by introducing the powder into an elongated nozzle through a multiplicity of separate feeds that enter said nozzle at points removed from the substrate to be coated;

maintaining said powder stream in continuous flow in the direction of the substrate;

introducing gas currents into this powder stream to create turbulences therein and homogenize the mixture of gas and powder as it advances toward the substrate; and

regularly accelerating the powder stream toward the substrate by entraining it in additional gas currents introduced at high velocity alongside the powder stream and aimed approximately in the direction of the substrate.

4,562,096

HEAT-CURABLE SILICONE COMPOSITIONS, USE THEREOF AND STABILIZER THEREFOR

Peter Y. K. Lo; LeRoy E. Thayer, both of Midland, and Antony P. Wright, Mills Township, Midland County, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Dec. 24, 1984, Ser. No. 685,507
Int. Cl.[4] C08G *77/12;* **B05D** *5/10*
U.S. Cl. 427—208.8 **28 Claims**

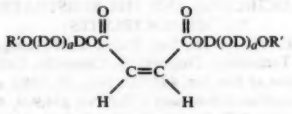
1. A curable composition obtained by homogeneously mixing components comprising

(A) an organosilicon component having an average of from one to three silicon-bonded monovalent radicals per silicon atom selected from the group consisting of hydroxyl radicals, hydrocarbon radicals, aliphatically saturated halohydrocarbon radicals and cyanoalkyl radicals, there being an average of at least two monovalent radicals per molecule of Component (A), selected from the group consisting of hydroxyl radicals and olefinic hydrocarbon radicals, the remaining silicon valences thereof being satisfied by divalent radicals, free of aliphatic unsaturation, selected from the group consisting of oxygen atoms, hydrocarbon radicals, hydrocarbon ether radicals, halohydrocarbon ether radicals and halohydrocarbon radicals, said divalent radicals linking silicon atoms,

(B) an organosilicon component containing at least two silicon-bonded hydrogen atoms per molecule of Component (B) and an average of from one to two silicon-bonded monovalent radicals per silicon atom selected from the group consisting of cyanoalkyl radicals, hydroxyl radicals and aliphatically saturated hydrocarbon and halohydrocarbon radicals, the remaining silicon valences thereof being satisfied by divalent radicals, free of aliphatic unsaturation, selected from the group consisting of oxygen atoms, hydrocarbon radicals, hydrocarbon ether radicals, halohydrocarbon ether radicals and halohydrocarbon radicals, said divalent radicals linking silicon atoms,

(C) an amount of a platinum group metal-containing catalyst component sufficient to accelerate a reaction of said silicon-bonded olefinic hydrocarbon and/or hydroxyl radicals with said silicon-bonded hydrogen atoms at room temperature, and

(D) an amount of a hydrocarbonoxyalkyl maleate sufficient to retard said reaction at room temperature but insufficient to prevent said reaction at elevated temperature, said hydrocarbonoxyalkyl maleate having the formula



wherein each R' denotes, independently, a monovalent hydrocarbon radical having from 1 to 6 carbon atoms, each D denotes, independently, an alkylene radical having from 2 to 4 carbon atoms and each a h... an average value of from 0 to 5, the amounts of Components (A) and (B) being sufficient to provide a ratio of the number of silicon-bonded hydrogen atoms to the number of silicon-bonded olefinic hydrocarbon radicals plus silicon-bonded hydroxyl radicals of from 1/100 to 100/1.

21. A process for rendering a solid surface less adherent to materials that normally adhere thereto, said process comprising

(I) applying to said solid surface a coating of a liquid curable composition comprising

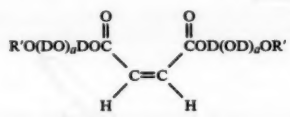
(A) a substantially linear organopolysiloxane component containing at least two silicon-bonded radicals per molecule thereof selected from the group consisting of vinyl radicals and hydroxyl radicals and having the formula $X_2RSiO(Me_2SiO)_b(MeViSiO)_dSiRX_2$ wherein Me denotes methyl, Vi denotes vinyl, each R denotes, indepen-

dently, an aliphatically saturated monovalent radical having from 1 to 20 carbon atoms selected from the group consisting of hydrocarbon radicals and halohydrocarbon radicals, each X denotes, independently, a monovalent radical selected from the group consisting of R radicals, vinyl radicals and hydroxyl radicals and b and d have average values such that the value of b plus d is sufficient to provide a viscosity at 25° C. of from 100 millipascal-seconds to 100 pascal-seconds for Component (A),

(B) a substantially linear organopolysiloxane component containing at least two silicon-bonded hydrogen atoms per molecule thereof and having the formula $YR_2SiO(-Me_2SiO)_p(MeHSiO)_qSiR_2Y$ wherein each Y denotes, independently, R or H, R is as denoted above, and p and q have average values such that the value of p plus q is sufficient to provide a viscosity at 25° C. of from 1 to 100 millipascal-seconds for Component (B),

(C) an amount of a platinum-containing catalyst component sufficient to accelerate a reaction of said silicon-bonded vinyl and/or hydroxyl radicals with said silicon-bonded hydrogen atoms at room temperature, and

(D) an amount of a hydrocarbonoxyalkyl maleate sufficient to retard said reaction at room temperature, but insufficient to prevent said reaction at elevated temperature, said hydrocarbonoxyalkyl maleate having the formula



wherein each R′ denotes, independently, a monovalent hydrocarbon radical having from 1 to 6 carbon atoms, each D denotes, independently, an alkylene radical having from 2 to 4 carbon atoms and each a has an average value of from 0 to about 5, the amounts of Components (A) and (B) being sufficient to provide a ratio of the number of silicon-bonded hydrogen atoms to the number of silicon-bonded vinyl radicals plus silicon-bonded hydroxyl radicals of from ½ to 1.5/1, and

(II) heating the applied coating for a period of time sufficient to cure the applied coating.

4,562,097

PROCESS OF TREATING FABRICS WITH FOAM

Andrew T. Walter; George M. Bryant, both of Charleston, W. Va., and Ronald L. Readshaw, Bridgewater, N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 148,226, May 9, 1980, abandoned, which is a continuation-in-part of Ser. No. 883,241, Mar. 3, 1978, abandoned, which is a continuation-in-part of Ser. No. 670,528, Mar. 25, 1976, abandoned. This application Nov. 30, 1983, Ser. No. 556,573

Int. Cl.⁴ B05D *1/26*

U.S. Cl. 427—209 **6 Claims**

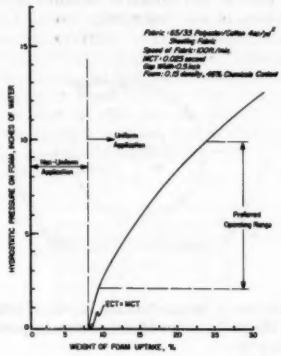
1. In a method of treating a porous substrate by the application to at least one surface thereof of at least one functional treating composition, the steps of:

(a) foaming said functional treating composition to produce a semi-stable foam having a foam density from 0.005 to 0.6 gram per cc, an average bubble size of from 0.05 to 0.5 millimeters in diameter, and a foam half life of 1 to 60 minutes;

(b) continuously conveying the foamed functional treating composition to an applicator nozzle;

(c) continuously conveying the substrate across and in contact with said applicator nozzle so as to simultaneously contact said substrate with said foamed functional treating composition and said applicator nozzle at a rate such that uniform application of said functional treating composition on said substrate is achieved;

(d) depositing a predetermined, controlled amount of said foamed functional treating composition on the surface of said substrate at said applicator nozzle, wheron said foam immediately breaks contact and is readily absorbed thereby to leave the surface of said substrate essentially dry to the touch; and



(e) recovering the treated substrate; wherein the functional treating composition comprises from 5 to 75 weight percent of functional chemical, from 0.2 to 5 weight percent of foaming agent, from 0 to 5 weight percent of wetting agent, and water making up the balance thereof.

4,562,098

WATER OR STEAM CURE OF AUTODEPOSITED RESIN COATINGS ON METALLIC SUBSTRATES

Bashir M. Ahmed, Ambler, Pa., assignor to Amchem Products Inc., Ambler, Pa.

Continuation-in-part of Ser. No. 517,133, Jul. 25, 1983, abandoned. This application Jul. 11, 1984, Ser. No. 629,924

Int. Cl.⁴ B05D *3/04, 3/02*

U.S. Cl. 427—341 **23 Claims**

1. A process for curing an uncured autodeposited coating comprising contacting a metallic surface with an autodepositing composition having resin solids dispersed in the aqueous phase of said composition to form on said surface an uncured autodeposited coating in the form of resin solids adhered thereto and subjecting said uncured autodeposited coating to steam or to water having a temperature of about 70° F. to about 212° F. for a period of time sufficient to cure said coating.

4,562,099

APPARATUS FOR APPLYING ADHESIVE

Dennis Hinchcliffe, London, England, assignor to Molins PLC, London, England

Filed Jan. 18, 1984, Ser. No. 573,275

Claims priority, application United Kingdom, Feb. 1, 1983, 8302663; Dec. 3, 1983, 8332328

Int. Cl.⁴ B05C *1/02*

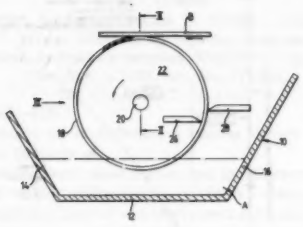
U.S. Cl. 427—282 **11 Claims**

11. A method for applying a plurality of spaced islands of liquid adhesive arranged in a predetermined pattern on a sheet-like material comprising:

(a) filling a plurality of spaced perforations arranged in said predetermined pattern in a thin peripheral wall of a rotatable hollow cylindrical member and substantially excluding said liquid adhesive from the interior and exterior surfaces of said peripheral wall, a first portion of said peforations in said peripheral wall having a greater depth considered in a direction transverse to the plane of said peripheral wall, and containing a greater volume of said adhesive than the remaining portion of said perforations in

said peripheral wall which are of lesser depth and contain a lesser volume of said adhesive; and

(b) positioning a surface of said sheet-like material in contact with said external surface of said peripheral wall to deposit adhesive retained in said perforations as said islands on said surface of said sheet-like material in said predetermined pattern, said islands of adhesive deposited by the perforations of said first portion having a greater depth



being thicker or denser than the islands of adhesive deposited by the perforations of said remaining portion having a lesser depth;

(c) whereby the adhesive contained in said smaller islands will dry more quickly than the adhesive contained in said larger islands, and the adhesive contained in said larger islands will provide a stronger bond between joined surfaces than the adhesive contained in said smaller islands.

4,562,100

POLYIMIDE COATING COMPOSITIONS FROM DIESTERIFIED ANHYDRIDE AND AROMATIC DIAMINE

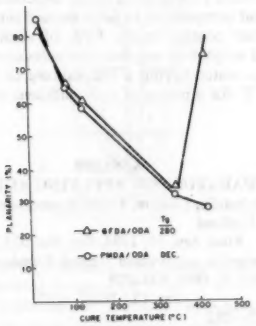
Michael Fryd, Haddonfield, and Burt T. Merriman, Jr., Willingboro, both of N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 14, 1984, Ser. No. 650,913

The portion of the term of this patent subsequent to Aug. 6, 2002, has been disclaimed.

Int. Cl.⁴ B05D *3/02;* **C08G** *69/26*

U.S. Cl. 427—385.5 **6 Claims**



1. A method of applying a polyimide coating having high planarity comprising the sequential steps:

(a) forming a solution in aprotic solvent of an aromatic dianhydride which has been at least 20% diesterified with a volatile alcohol;

(b) dissolving in the solution of step (a) a substantially equimolar amount of an aromatic diamine;

(c) applying the solution of step (b) to a substrate and heating it to a temperature of 200°–300° C. to effect de-esterification of the dianhydride with the formation of volatile alcohol therefrom, formation of polyamic acid by polycondensation of the dianhydride with the aromatic diamine and vaporization of volatile alcohol and solvent from the reaction solutions; and

(d) heating the polyamic acid to 300°–500° C. to effect essentially complete alcohol and solvent removal, dehydration of the polyamic acid, formation of the corresponding polyimide and reflow of the polyimide, the polyimide having a T_g of 250°–330° C. and containing repeating polymer units having at least 2 flexible linkages or at least 1 flexible linkage derived from the dianhydride, provided the amine groups of the diamine are in the meta position relative to each other.

4,562,101

SHIRRED SAUSAGE CASING AND PROCESS FOR ITS PRODUCTION

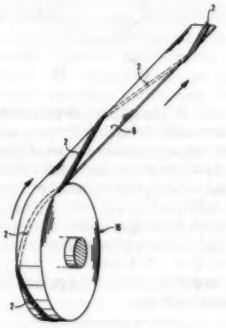
Klaus Andrä, Zornheim; Elfriede Hutschenrüter, Bad Schwalbach, and Horst-Erich Besier, Taunusstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 28, 1983, Ser. No. 489,594

Claims priority, application Fed. Rep. of Germany, May 3, 1982, 3216437

Int. Cl.⁴ F16L *11/00;* **A22C** *13/00*

U.S. Cl. 428—36 **15 Claims**



1. A shirred sausage casing, comprising a circular cylindrical casing of a web film having a seam region, formed from the edge regions of said web film, comprising an adhesive layer and extending in a helically twisted manner about the longitudinal axis of the shirred casing, wherein the number of helical turns of said seam region is greater than about 15 turns per 10 m of tube length.

4,562,102

ROLL OF PREDETERMINED LENGTH STRIPS OF PRESSURE-SENSITIVE TAPE

George R. Rabuse, Sunfish Lake, and Gary R. Hanson, Minneapolis, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

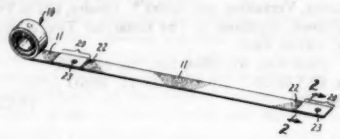
Filed Mar. 1, 1984, Ser. No. 585,140

Int. Cl.⁴ B32B *3/08, 3/10*

U.S. Cl. 428—43 **14 Claims**

1. A pressure-sensitive adhesive tape product comprising a roll of pressure-sensitive adhesive tape comprising a backing having a release coating on one surface and a pressure-sensitive adhesive coating on the opposite surface and having the adhesive coating contacting the release coating in the wound roll and said tape having transversely extending perforations at spaced intervals along the length of the roll to provide short tab portions of tape between the perforations separating second predetermined lengths of tape having a length substantially different from said tab portions, wherein said tab portions

between said perforations and said second predetermined lengths of tape are consecutive through the length of the roll to



provide a predetermined number of said second predetermined lengths of tape.

4,562,103

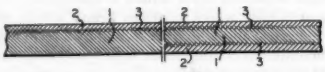
WEATHER RESISTANT BOARDS

Reinhard F. Hering, Via Matteo da Campione 5, CH 6911 Campione d'Italia, Switzerland

Continuation-in-part of Ser. No. 74,669, Oct. 23, 1979, abandoned. This application Oct. 14, 1982, Ser. No. 434,234

Int. Cl.⁴ B32B *5/16*

U.S. Cl. 428—76 **14 Claims**



1. A weather-resistant impregnated board possessed of a surface elasticity and pliancy by means of a permanently elastic covering layer comprising: an impregnatable porous base material constituted by a mixture of a curable resin, a base material comprising a lignocellulose fibrous or particle material and an inorganic mineral fibrous material; and an outer elastic covering layer constituted by a vulcanized weather-resistant, resilient synthetic elastomeric material which has been vulcanized thereon in situ at a temperature of at least 175° C.; said vulcanized outer material being both adhered securely to one outer surface of said base material, and when in unvulcanized form, penetrated and impregnated below and into the same outer surface of said base material to be within the porous structure of said base material and being vulcanized therein in situ at a temperature of at least 175° C.

4,562,104

ADHESIVE BONDING OF SCATTER COATED METAL OBJECTS

Takao Maeda, Kariya, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

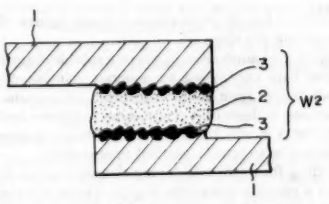
Filed Jun. 20, 1978, Ser. No. 917,286

Claims priority, application Japan, Jul. 6, 1977, 52-80586

The portion of the term of this patent subsequent to Dec. 31, 2000, has been disclaimed.

Int. Cl.⁴ B32B *5/16*

U.S. Cl. 428—148 **6 Claims**



5. Adhesively bonded metallic objects comprising a first metallic object, a thin scattered aluminum containing surface coating friction welded onto the first object, a second metallic object, a thin scattered aluminum containing surface coating friction welded onto the second object, and an adhesive between said surface coatings and adhesively bonding said surface coatings together to bond said objects together.

4,562,105

FERRIMAGNETIC OXIDES AND MAGNETO-OPTICAL RECORDING MEDIUM EMPLOYING THE SAME

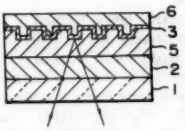
Hazime Machida, Tokyo, and Motoharu Tanaka, Numazu, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 30, 1984, Ser. No. 595,021

Claims priority, application Japan, Apr. 8, 1983, 58-60800

Int. Cl.⁴ G11B *9/00*

U.S. Cl. 428—161 **12 Claims**



1. A magneto-optical recording medium comprising a transparent substrate, a perpendicular, magnetic-anisotropic, magnetic film layer formed thereon, which magnetic film layer comprises a ferrimagnetic oxide of the following formula

$$MeM_{Ix}M_{IIy}Fe_{12-(\frac{m}{3}\times+\frac{n}{3}y)}O_{19}$$

wherein Me represents at least one element selected from the group consisting of Ba, Sr and Pb, M_I is at least one element selected from the group consisting of Ga and Al, M_{II} is at least one element selected from the group consisting of Bi, Gd, Tb, Dy, Ho, La, Y, Co, Zn, Ti, Sc, In, Sn, Ca, Cr, Ni and Ge, $1 \leqq x \leqq 8$, $0 < y \leqq 6$, $1 \leqq x+y \leqq 8$, m is an ion valence of M_I and n is an ion valence of M_{II}, and a reflection layer formed on the magnetic film layer.

4,562,106

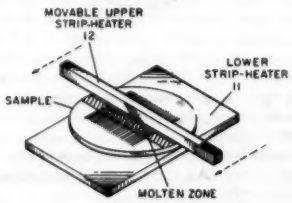
PRODUCT MADE BY METHOD OF ENTRAINING DISLOCATIONS AND OTHER CRYSTALLINE DEFECTS

Michael W. Geis, Acton, and Henry I. Smith, Sudbury, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 391,130, Jun. 23, 1982, Pat. No. 4,479,846. This application Jun. 4, 1984, Ser. No. 617,311

Int. Cl.⁴ B32B *33/00*

U.S. Cl. 428—195 **3 Claims**



1. A product made by the method of entraining dislocations and other crystalline defects in a film on a substrate which method includes the steps of intentionally creating a predetermined pattern in a region embracing at least one of said film and said substrate to form a patterned region,

and processing said film by passing a heated zone through said film in a predetermined direction to establish dislocations and other crystalline defects in said film entrained to follow said pattern and located at predetermined positions related to said pattern.

4,562,107

TEXTILE FABRICS WITH OPAQUE PIGMENT PRINTING AND METHOD OF PRODUCING SAME

John Y. Daniels, Pineville, N.C., assignor to Springs Industries, Inc., Fort Mill, S.C.

Continuation-in-part of Ser. No. 429,794, Sep. 30, 1982, Pat. No. 4,457,980, which is a continuation-in-part of Ser. No. 294,782, Aug. 20, 1981, abandoned. This application Jul. 2, 1984, Ser. No. 626,677

Int. Cl.⁴ B32B *3/00*

U.S. Cl. 428—196 **18 Claims**

10. A printed textile fabric formed of precolored yarns of a predetermined relatively dark color, selected areas of said fabric having printed pattern areas of predetermined relatively lighter color contrasting with the darker color of the yarns, said printed pattern areas being opaque and thus substantially unaffected by the relatively darker color of the yarns and having high chroma, and said pattern areas comprising a wash-fast film-like opaque pigmented coating on the exposed surface portions of the individual yarns and individually encapsulating and coating exposed fibers present at the surface of the yarns and hiding the underlying color thereof while allowing the interengaged yarn structure of the fabric to remain visible, said opaque coating comprising an opacifier providing opacity in said coating and containing at least one opaque pigment with minimal tinctorial value and a refractive index of less than 1.8, at least one additional pigment of a predetermined tinctorial value for imparting the desired color to the printed area, and a latex polymer binder bonding said pigments to the yarns.

4,562,108

HEAT-RETAINING MOISTURE-TRANSMISSIBLE WATER-RESISTANT FABRIC

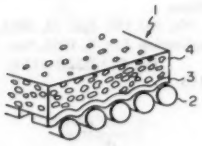
Masao Miyake, Otsu, and Teruo Akita, Kusatsu, both of Japan, assignors to Asahi Kasei Textiles Ltd., Osaka, Japan

Division of Ser. No. 487,949, Apr. 25, 1983, Pat. No. 4,510,194. This application Dec. 5, 1984, Ser. No. 678,326

Claims priority, application Japan, Apr. 28, 1982, 57-74365; Dec. 29, 1982, 57-233171; Jan. 14, 1983, 58-4722

Int. Cl.⁴ B32B *7/02, 3/26, 27/40*

U.S. Cl. 428—212 **9 Claims**



1. A heat-retaining moisture-transmissible water-resistant fabric comprising:

a fibrous substrate;

a polymer layer having a multiplicity of interconnecting fine pores (layer A), formed on at least one surface of the fibrous substrate; and

a polymer layer (layer B) containing 15 to 70% by weight, based on the polymer of layer B, of heat ray-reflecting fine metal pieces and having a multiplicity of interconnecting fine pores communicating from the surface to the interior and also having on the surface thereof fine pores, most of which have a size of not larger than 5 μm, said layer B being formed on layer A.

4,562,109

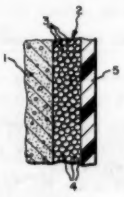
CRACK RESISTANT COATING FOR MASONRY STRUCTURES AND PROCESS FOR APPLYING SAME

John D. Harvey, Versailles, and Andre V. Gindre, Gif S/Yvette, both of France, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 31, 1984, Ser. No. 645,989

Int. Cl.⁴ B32B *3/26, 5/16, 13/12;* **B05D** *7/00*

U.S. Cl. 428—220 **19 Claims**



1. A crack resistant coating for masonry structures subject to cracking comprising:

(1) a crack absorbing layer which is contiguous to the masonry structure which contains beads which are essentially spherical and which are bound by a resin binder, and

(2) a conventional coating layer which is contiguous to and covers the crack absorbing layer wherein the resin binder exhibits sufficient flexibility to allow a degree of rolling action between the beads, thereby absorbing cracks forming in the masonry structure and preventing the transmission of the cracks to the conventional coating layer.

2. A crack resistant coating as specified in claim 1 wherein said beads have a diameter of from about 1 mm to about 6 mm.

4,562,110

PROCESS FOR THE PRODUCTION OF ALGINATE FIBRE MATERIAL AND PRODUCTS MADE THEREFROM

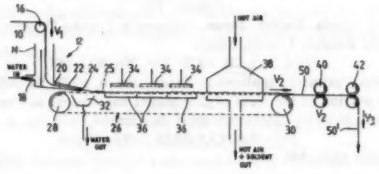
David P. Tong, 54 Berrington Rd., Nuneaton, Warwickshire, England

Filed Aug. 17, 1982, Ser. No. 408,973

Claims priority, application United Kingdom, Aug. 18, 1981, 8125178

Int. Cl.⁴ D01F *9/04;* **A61F** *13/00;* **A61L** *15/00*

U.S. Cl. 428—284 **42 Claims**



1. A process for the production of dried alginate fibre material comprising the steps of:

(a) spinning an aqueous solution of a soluble alginate salt into a spin bath containing an aqueous solution of a salt, to produce wet spun continuous fibres of insoluble alginate,

(b) forming a sheet of the wet spun insoluble undried alginate fibres in which the individual fibres are separated and disposed in generally parallel relationship,

(c) feeding forwards and laying the sheet of undried fibres onto a moving conveyor device which is travelling at a slower speed than said sheet in the feed direction whereby the fibres become overlaid in crossing-over intersecting relationship to form a web configuration having a defined width,

(d) dewatering the web configuration of intersecting overlaid fibres to effect a drying operation to produce a dried web of crossing-over fibres having a minimal amount of bonding between said fibres,

(e) said process including treating the fibres of the web to minimize the bonding together of the overlaid crossing-over fibres at their point of contact during the dewatering step, and then following the dewatering step,

(f) stretch-breaking the sheet of overlaid fibres across the width of the web to to cause said fibres to be disposed generally parallel with respect to each other and extending lengthwise of the web while being randomly broken and to further cause the breaking apart of bonded, crossed-over fibres.

6. A dried non-woven web of alginate fibres comprising:

(a) dried alginate fibre material as produced in the process of claim 1 wherein the tenacity of said web measured in the transverse direction is not more than twenty-five percent (25%) of the tenacity measured in the longitudinal direction.

40. A unitary, dried non-woven web of alginate fibres comprising:

(a) fibres disposed generally parallel with respect to each other and extending lengthwise of the web,

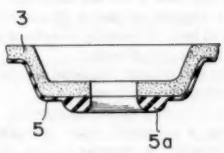
(b) there is a minimal inter-fibre bonding with the fibres being randomly broken along their lengths,

(c) The tenacity of said web has a value when measured in the transverse direction which is not more than twenty-five percent (25%) of the tenacity measured in the longitudinal direction.

4,562,111
VARIOUS-COVERS AND METHOD FOR PRODUCING SAME

Naoki Ogawa, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 24, 1982, Ser. No. 361,260
Claims priority, application Japan, Mar. 26, 1981, 56-44520
Int. Cl.⁴ D04H *1/58*
U.S. Cl. 428—289 **9 Claims**



1. A cover for use in connection with an engine, comprising a fibrous composite layer which includes a fiber material, a synthetic resin, a cross-linking agent for cross-linking said resin and an impregnated rubber material, said rubber material being dispersed essentially throughout said composite layer.

4,562,112
POLYIMIDE FOAM AND PROCESS FOR THE PREPARATION OF SAME

Raymond Lee, Elk Grove Village; Gregory A. Ferro, Mt. Prospect, and David W. Okey, Downers Grove, all of Ill., assignors to Imi-Tech Corporation, Elk Grove Village, Ill.

Filed Jan. 29, 1985, Ser. No. 696,007
Int. Cl.⁴ B32B *5/14, 5/18*
U.S. Cl. 428—318.6 **23 Claims**

1. A polyimide foam article having a flexible, hydrophobic, non-porous, vapor-impermeable skin on one surface thereof comprising a polyimide foam prepared by foaming a prepolymer prepared from (a) an organic tetracarboxylic acid or its anhydride or ester derivative, (b) an aromatic diamine having the formula:

$$H_2N—R_2—NH_2$$

wherein R_2 is an aromatic group containing 5 to 16 carbon atoms and (c) an organic liquid diamine containing at least 50% by weight of a conjugated diene, said skin produced by heating at least one surface of the foam to coalesce the polyimide on the surface to form the flexible, non-porous, vapor-impermeable skin on the surface.

4,562,113
ELECTRICALLY CONDUCTIVE PLASTIC COMPLEX MATERIAL

Kunio Yonahara, Yokohama, and Shingo Aimoto, Tokyo, both of Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Dec. 27, 1983, Ser. No. 565,340
Claims priority, application Japan, Dec. 27, 1982, 57-227117
Int. Cl.⁴ B32B *9/00;* **C25B** *11/12;* **H01M** *6/48, 10/18*
U.S. Cl. 428—331 **2 Claims**

1. An electrically conductive plastic complex material, said material being used as an electrode for an electrochemical reaction, said material consisting essentially of:

a polyethylene polymer having a density of from 0.94 to 0.98 g/cm^3,

an electrically conductive carbon black; and

an inorganic filler selected from the group consisting of calcium carbonate, talcum, alumina, silica, titania and mixtures thereof, wherein the filler has a particle size of 200 mesh or less.

4,562,114
WATER-ABSORBING ACRYLIC FIBERS

Shigeru Sawanishi, and Mitsuru Wakitani, both of Okayama, Japan, assignors to Japan Exlan Company Limited, Osaka, Japan

Continuation of Ser. No. 401,982, Jul. 26, 1982, abandoned. This application Feb. 14, 1985, Ser. No. 702,422
Claims priority, application Japan, Aug. 10, 1981, 56-125509
Int. Cl.⁴ D02G *3/00*
U.S. Cl. 428—372 **3 Claims**

1. Water-absorbing acrylic fiber having an outer and an inner layer and being composed of not less than 90 weight % of an acrylonitrile polymer and having dispersed therein less than 10 weight % of water-absorbing resin particles containing carboxyl groups, represented by —COOX wherein X is H, NH_4 or an alkali metal and said resin having substantially no water-swellability when X is H and having a degree of water-swellability of 10–300 cc/g when X is NH_4 or an alkali metal, the particle diameter of which resin being not larger than 0.5μ at absolute dryness, the particles of water-absorbing resin present at least in the outer layer of the fibers having carboxyl groups wherein X is H, the particles of water-absorbing resin present in the inner layer having said carboxyl groups wherein X = NH_4 or alkali metal and said particles being present in an amount sufficient to render the fiber water-absorbing, a cross-section of said fibers containing not less than 5 pores no smaller than 0.2μ in their maximum diameter and said fibers having a water-holding ratio not lower than 20%, said fibers being obtained by wet-spinning a spinning solution composed of an acrylonitrile polymer and said water-absorbing resin particles, water-washing the resulting fibers, acid treating the fibers at a pH not higher than 4, subjecting the fibers to heat-stretching treatment and dry-compacting treatment, followed by wet-heat relaxing treatment at a temperature not lower than 110° C. and then drying the fibers at 105°–170° C., the water-absorbing resin being present at 0.5 to 7 wt. %.

4,562,115

COMPOSITES AND SIZE COATED GLASS FIBERS USED THEREIN

William L. Hergenrother, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 520,388, Aug. 4, 1983. This application Oct. 1, 1984, Ser. No. 656,211

Int. Cl.[4] D02G 3/00

U.S. Cl. 428—392 5 Claims

1. Glass fibers having a size coating thereon, said size coating comprising maleic anhydride adduct of 1,2-polybutadiene having a number average molecular weight of more than 10,000 and a crystallinity ranging from 0% to 50%, said adduct being soluble in an organic solvent, the amount of said adduct forming the size coating ranging from about 0.1 grams to about 6 grams per 100 grams of glass fibers said adduct having been formed in the absence of a free radical initiator.

4,562,116

MICROCAPSULE FOR PRESSURE-SENSITIVE RECORDING PAPER AND PROCESS FOR PRODUCING THE SAME

Yoshio Okada, and Yuriko Igarashi, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 5, 1982, Ser. No. 439,431

Claims priority, application Japan, Nov. 12, 1981, 56-181303

The portion of the term of this patent subsequent to Jul. 17, 2001, has been disclaimed.

Int. Cl.[4] B01J 13/02; B32B 27/20

U.S. Cl. 428—402.21 9 Claims

1. A process for preparing microcapsules for pressure-sensitive recording paper, which process comprises polycondensing a water-soluble cationic urea resin with either:

(i) at least two prepolymers selected from the group consisting of a melamine-formaldehyde prepolymer, a thiourea-formaldehyde prepolymer, and a melamine-thiourea-formaldehyde prepolymer; or

(ii) a melamine-thiourea-formaldehyde prepolymer, on the surface of droplets of a color-former dispersed in an aqueous medium,

the polycondensation being effected in the presence of an anionic surfactant selected from the group consisting of salts of fatty acids, sulfate esters of higher alcohols and salts of alkylarylsulfonic acid and also in the presence of an acidic catalyst while causing a complex-coacervation between the water-soluble cationic urea resin and the anionic surfactant.

8. Microcapsule suitable for pressure-sensitive recording paper comprising:

(a) a color-former solution; and

(b) a membranous wall wherein said membranous wall encapsulates said color-former solution and said membranous wall is formed by the polycondensation of a water-soluble cationic urea resin, and a reactant selected from the group consisting of:

(i) at least two prepolymers selected from the group consisting of:

(A) melamine-formaldehyde prepolymer;

(B) thiourea-formaldehyde prepolymer; and

(C) melamine-thiourea-formaldehyde prepolymer; or

(ii) melamine-thiourea-formaldehyde, wherein said polycondensation reaction is conducted in the presence of an anionic surfactant selected from the group consisting of salts of fatty acid, sulfate esters of higher alcohols and salts of alkylarylsulfonic acid, and also in the presence of an acid catalyst.

4,562,117

MAGNETIC RECORDING MEDIUM AND A PROCESS OF FABRICATING SUCH MAGNETIC RECORDING MEDIUM

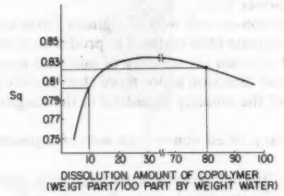
Shozo Kikukawa, Akigawa, and Yoshitaka Yasufuku, Hino, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed May 25, 1984, Ser. No. 614,465

Claims priority, application Japan, May 26, 1983, 58-93054; May 26, 1983, 58-93055; Sep. 24, 1983, 58-176657; Sep. 24, 1983, 58-176658

Int. Cl.[4] G11B 5/70

U.S. Cl. 428—407 14 Claims



1. A magnetic recording medium comprising a support and a magnetic layer thereon, said magnetic layer being formed by coating said support with a magnetic paint comprising

(a) an organic solvent,

(b) an organic binder, and

(c) a magnetic powder,

said magnetic powder being pre-treated with a copolymer containing at least one monomer component having an anionoid organic group in the form of a salt and a second monomer component, said copolymer being capable of being dissolved in water in an amount of at least 10 parts by weight of said copolymer per 100 parts by weight of water.

9. A process of preparing a magnetic recording medium comprising

(i) treating a magnetic powder in an aqueous or hydrophilic medium with a copolymer which contains at least 1 monomer component having an anionoid organic group in the form of a salt and a second monomer component, said copolymer capable of being dissolved in water in an amount of at least 10 parts by weight of said copolymer in 100 parts by weight of water,

(ii) separating said treated magnetic powder from said aqueous or hydrophilic medium,

(iii) drying said treated magnetic powder,

(iv) preparing a magnetic paint comprising said treated magnetic powder, an organic binder, and an organic solvent, and

(v) coating said magnetic paint on a support to form said magnetic recording medium.

4,562,118

FILMS, SHEETS, LAMINATES AND MOLDED ARTICLES HAVING GAS BARRIER PROPERTIES

Yoshitsugu Maruhashi; Fumio Kano, both of Yokohama; Muneki Yamada, Fujisawa, and Sadao Hirata, Kamakura, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Division of Ser. No. 460,757, Jan. 25, 1982, Pat. No. 4,500,677. This application Oct. 24, 1984, Ser. No. 664,308

Claims priority, application Japan, Jan. 29, 1982, 57-11741

Int. Cl.[4] B32B 27/36; C08L 29/04

U.S. Cl. 428—412 18 Claims

1. A film or sheet obtained by heat-molding a resin composition having excellent drawability which comprises (A) a saponified ethylene-vinyl ester copolymer having an ethylene content of 20 to 55 mole% and a saponification degree of at least 95%, (B) a saponified ethylene-vinyl ester copolymer having an ethylene content of 25 to 60 mole% and a saponifica-

tion degree of at least 90%, the ethylene content of the saponified copolymer (B) being higher by at least 3 mole% than the ethylene content of the saponified copolymer (A), and (C) a polyamide having a film-forming molecular weight, wherein the weight ratio of the saponified copolymer (A) to the saponified copolymer (B) is in the range of from 90/10 to 10/90 and the weight ratio of the sum of the saponified copolymers (A) and (B) to the polyamide (C) is in the range of from 95/5 to 5/95, into a film or sheet.

10. A laminated film comprising as one layer thereof a resin composition comprising (A) a saponified ethylene-vinyl ester copolymer having an ethylene content of 20 to 55 mole% and a saponification degree of at least 95%, (B) a saponified ethylene-vinyl ester copolymer having an ethylene content of 25 to 60 mole% and a saponification degree of at least 90%, the ethylene content of the saponified copolymer (B) being higher by at least 3 mole% than the ethylene content of the saponified copolymer (A), and (C) a polyamide having a film-forming molecular weight, wherein the weight ratio of the saponified copolymer (A) to the saponified copolymer (B) is in the range of from 90/10 to 10/90 and the weight ratio of the sum of the saponified copolymers (A) and (B) to the polyamide (C) is in the range of from 95/5 to 5/95, and a second layer of a material prepared from a polymer selected from the group consisting of polyethylene, polypropylene, ethylene-vinyl propylene copolymers, ethylene-propylene copolymers, ethylene-vinyl acetate copolymers, ion-crosslinked olefin copolymers, polyethylene terephthalate, polycarbonates, polystyrene, polyvinyl chloride, polyvinylidene chloride, methacrylic resins, and poly-4-methylpentene-1.

4,562,119

FLEXIBLE, PRINTED CIRCUIT

Roland Darms, Therwil; Harry Beyeler, Basel, and Theobald Haug, Frenkendorf, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

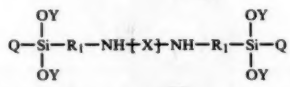
Continuation-in-part of Ser. No. 531,589, Sep. 13, 1983, abandoned, which is a continuation of Ser. No. 422,424, Sep. 23, 1982, abandoned, which is a continuation of Ser. No. 298,965, Sep. 3, 1981, abandoned. This application Aug. 17, 1984, Ser. No. 641,893

Claims priority, application Switzerland, Sep. 15, 1980, 6905/80

Int. Cl.⁴ B32B *15/08*

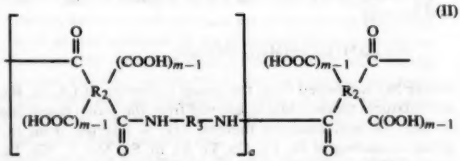
U.S. Cl. 428—458 **5 Claims**

1. A flexible, printed circuit with excellent adhesion of the printed circuit tracks, which is obtained by coating one side of a metal foil without any interlayer with a polymer consisting of a polyamide, polyimide or polyamide-imide which contains siloxane groups, the silicon content being 0.1 to 2.0% by weight, and is obtained by heating a silicon modified polyamide prepolymer, polyamide-acid prepolymer or polyamide-amido-acid prepolymer, of intrinsic viscosity from 0.3 to 4.0, of the formula I



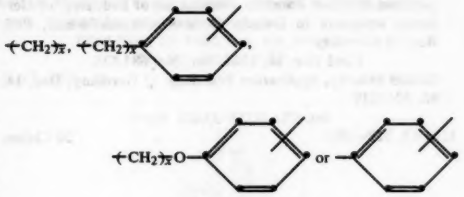
(I)

in which X is a structural element of the formula II



(II)

a is a number from 15 to 100 and the individual symbols or radicals m, R_1, R_2, R_3, Q and Y, independently of one another, are defined as follows: m is 1 or 2, R_1 is a



radical, x being a number from 1 to 4, R_2 is a carbocyclic-aromatic or heterocyclic radical, in which the carboxamide groups and carboxyl groups are bonded to different ring carbon atoms and the carboxyl groups are each in the ortho-position to a carboxamide group, R_3 is a carbocyclic-aromatic or heterocyclic radical, Q is methyl, phenyl or a radical —OY and Y is an alkyl radical of 1 to 6 carbon atoms or a phenyl radical, heating the coated metal foil in the temperature range from 50° to 300° C. till a tack-free coating is obtained, exposing the opposite side of the coated metal foil, which side is provided with a photolacquer, through a photo mask, and developing the exposed metal foil.

4,562,120

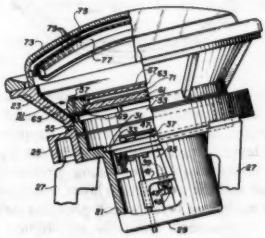
HEAT-RESISTANT, OPTICALLY-BLACK COATING

Randolph H. Axelrod, Warwick Township, Lancaster County, and Joseph J. Piascinski, Upper Leacock Township, Lancaster County, both of Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Aug. 10, 1984, Ser. No. 640,409

Int. Cl.⁴ B32B *9/00*

U.S. Cl. 428—469 **4 Claims**

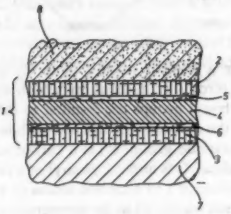


1. A metal substrate having adhered thereto an optically black coating, having a low reflectance of light in the range of about 2000 to 7500 Å, chemically stable up to at least 750° C., and consisting essentially of a minor proportion of an inorganic silicate binder and a major proportion of a particulate mixture of cobaltic oxide and zinc oxide in the weight ratio range of 4/1 to 1/1.

4,562,121
SOLDERING FOIL FOR STRESS-FREE JOINING OF CERAMIC BODIES TO METAL

Karl-Heinz Thiemann, Korb; Hans-Juergen Weinert, Wendlingen, and Wilfried Räuchle, Wernau, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 14, 1984, Ser. No. 681,635
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1983, 3345219
Int. Cl.[4] B23K *35/20, 35/40*
U.S. Cl. 428—607 20 Claims

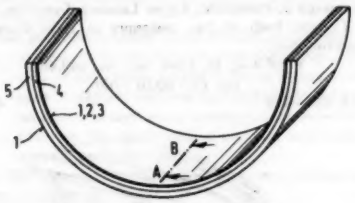


1. A soldering foil comprising:
a cushion layer of a material selected from the group consisting of copper, iron, nickel, a copper-beryllium alloy, a nickel-iron alloy and low carbon steel,
a silver barrier layer adjacent each side of said central cushion layer, and
an active solder layer adjacent each said silver barrier layer.

4,562,122
MULTI-LAYER PLAIN BEARING

Erich Hodes, Rosbach; Peter Lippok, Wiesbaden-Biebrich, and Bernd Miotk, Mainz-Kostheim, all of Fed. Rep. of Germany, assignors to Glyco-Metall-Werke, Daelen & Loos GmbH, Wiesbaden, Fed. Rep. of Germany

Filed Feb. 13, 1984, Ser. No. 579,850
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1983, 3304740
Int. Cl.[4] B32B *15/00*
U.S. Cl. 428—644 6 Claims

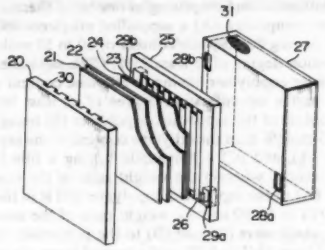


1. A multi-layer plain bearing composed of a strong metallic backing, a softer metallic support layer, and a galvanically applied metallic antifriction layer, the support layer and the antifriction layer being of mutually different metals or metallic alloys, an intermediate layer being provided between the support layer and the antifriction layer, wherein the intermediate layer is made as a layer which prevents or limits diffusion of metallic components from the antifriction layer into the support layer and vice versa, and which is composed of a binding layer entering into a lasting surface bond with the material of the antifriction layer, and of an underlayer entering into a lasting surface bond with the material of the support layer the support layer being of a bearing alloy having at least emergency running properties, the antifriction layer being of a tin-containing alloy on lead basis, the binding layer being of an alloy consisting substantially of copper and tin, and the underlayer being of a material selected from the group consisting of zinc, tin, and an alloy containing zinc and tin.

4,562,123
LIQUID FUEL CELL

Toshio Shimizu, Katsuta; Takanori Satou; Tsutomu Tsukui, both of Hitachi; Ryouta Doi, Ibaraki, and Motoo Yamaguchi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 12, 1984, Ser. No. 649,605
Claims priority, application Japan, Sep. 14, 1983, 58-168204
Int. Cl.[4] H01M *4/00*
U.S. Cl. 429—27 22 Claims

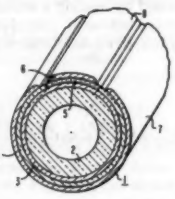


1. A liquid fuel cell including a fuel electrode and an oxidizer electrode disposed opposite to each other with an electrolyte layer being interposed therebetween, a fuel chamber disposed adjacent to said fuel electrode, an oxidizer chamber disposed adjacent to said oxidizer electrode, and a fuel tank supplying liquid fuel to said fuel chamber, said fuel cell comprising a first passage connecting between a non-charged space in said fuel tank and said fuel chamber, a second passage disposed at a position diagonal with respect to said first passage for supplying said fuel from said fuel tank to said fuel chamber, and gas venting ports provided with gas-liquid separating means and disposed on at least one of said non-charged space of said fuel tank and said first passage communicating therewith and also disposed on at least one of the fuel-charged space of said fuel tank and said second passage communicating therewith.

4,562,124
AIR ELECTRODE MATERIAL FOR HIGH TEMPERATURE ELECTROCHEMICAL CELLS

Roswell J. Ruka, Churchill Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 22, 1985, Ser. No. 693,903
Int. Cl.[4] H01M *8/12*
U.S. Cl. 429—30 13 Claims



1. A compound comprising a solid solution having the general formula

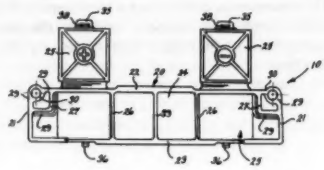
$$La_{1-x-w}(M_L)_x(Ce)_2(M_{S1})_{1-y}(M_{S2})_yO_3$$

where M_L is selected from the group consisting of Ca, Sr, Ba, and mixtures thereof, M_{S1} is selected from the group consisting of Mn, Cr, and mixtures thereof, M_{S2} is selected from the group consisting of Ni, Fe, Co, Ti, Al, In, Sn, Mg, Y, Nb, Ta, and mixtures thereof, w is about 0.05 to about 0.25, x+w is about 0.1 to about 0.7, and y is 0 to about 0.5, but not exceeding the solubility limit.

4,562,125
BATTERY HOLD-DOWN STRAP AND TERMINAL PROTECTOR

Robert K. Davis, deceased, late of Kankakee County, Ill. (by Clerie R. Davis, executor), assignor to Roper Corporation, Kankakee, Ill.

Filed Jan. 25, 1985, Ser. No. 695,089
Int. Cl.[4] H01M 2/10
U.S. Cl. 429—65 20 Claims

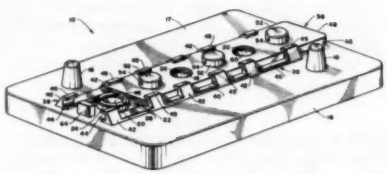


1. A hold-down strap and electrical terminal protector for a storage battery having electrical terminals projecting from the upper surface thereof, comprising, in combination,
- an elongated body having a length substantially equal to the length of the battery and a width substantially less than the width of the battery,
- a connecting portion at each end of said body adapted to receive and cooperate with a hold-down connector secured to means for supporting the battery
- and means inboard of said connecting portions for substantially enclosing each of said battery terminals, said terminal enclosing means including a selectively openable access cover.

4,562,126
STORAGE BATTERY COVER

Armand N. Chartrain, 115 Poinsettia Gardens, Ventura, Calif. 93004, and Lee A. Genne, 1220 Johnson Dr., No. 111, Ventura, Calif. 93003

Filed Sep. 21, 1984, Ser. No. 652,954
Int. Cl.[4] H01M 2/04
U.S. Cl. 429—72 10 Claims

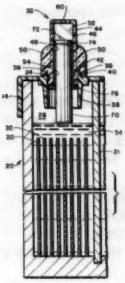


1. A storage battery cover having at least three battery cell fill inlets for replenishment of electrolyte comprising:
- an annular rim about the periphery of each inlet having sealing means about the upper surface thereof;
- a slide member having a length less than the length of the battery cover but of sufficient length to overlie said inlets with at least portions of the underside thereof having an engagement surface in sealing contact with each sealing means, said slide member including at least two fill openings therethrough located to overlie at least two inlets when said member is moved from a sealed position a predetermined distance; and,
- guide means for maintaining the slide member in alignment over said inlets while allowing the movement thereof along the longitudinal axis of said member.

4,562,127
BATTERY CAP WITH ELECTROLYTE LEVEL INDICATOR

Pascuale Mangone, Ventura, Calif., assignor to Domingo Mangone, Buenos Aires, Argentina

Filed Mar. 29, 1984, Ser. No. 594,937
Int. Cl.[4] H01M 2/00
U.S. Cl. 429—89 13 Claims

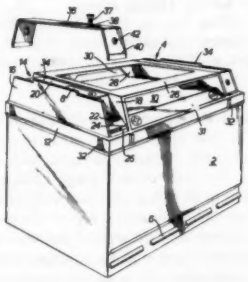


1. A battery cap with an electrolyte level indicator comprising in combination:
- a hollow body member having a base for sealingly engaging an opening in the top wall of a cell of a battery, and a long cylindrical hollow tube portion having an upper transparent section with a closed upper end extending above said base and a lower section with an open lower end depending downwardly into the battery cell, both said sections being connected to the base and together forming an elongated, constant diameter, cylindrical hollow cavity;
- a closed, constant diameter cylindrical colored float member having an enlarged top collar mounted in the hollow cavity; and
- a stop member attached to the open lower end of said lower section having an opening smaller than the collar but larger than the diameter of the float for preventing the float from falling through said opening when the cap is removed from the cell.

4,562,128
ELECTRIC STORAGE BATTERIES

John K. Humphreys, Whitefield, and Joseph Valentine, Bolton, both of England, assignors to Chloride Group Public Limited Company, London, England

Filed Nov. 2, 1984, Ser. No. 667,821
Claims priority, application United Kingdom, Nov. 4, 1983, 8329565
Int. Cl.[4] H01M 2/02, 2/30
U.S. Cl. 429—178 15 Claims



1. An electric storage battery comprising a substantially

rectangular container having at least two opposed vertical side surfaces, a lid sealing said container, the lid having two opposed side edges, two spaced upstanding formations extending adjacent the respective opposed side edges of said lid and support means extending between said two upstanding formations, said support means affording a substantially flat upper surface which is vertically spaced from the remainder of said lid and adpated to support a further such battery, said support means having two outer edges, said outer edges being spaced inwardly from said two opposed side surfaces of said container when viewed in plan.

4,562,129

METHOD OF FORMING MONOCHROMATIC OR DICHROMATIC COPY IMAGES

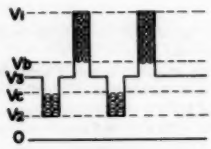
Susumu Tanaka, Aichi, and Kaoru Takebe, Toyokawa, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 21, 1983, Ser. No. 534,144

Claims priority, application Japan, Sep. 28, 1982, 57-169991; Nov. 25, 1982, 57-207334

Int. Cl.⁴ G03G *13/01*

U.S. Cl. 430—42 **9 Claims**



1. An image forming method which comprises a first step of forming an electrostatic latent image having at least three levels of different potentials; a second step of developing said electrostatic latent image with a developer while applying to a developing electrode a voltage substantially equal to or close to an intermediate potential, said developer being composed of at least two components of a nonmagnetic insulating toner and a high-resistivity magnetic carrier triboelectrically chargeable with the toner and having a high resistivity of at least 10^{12} ohm-cm, the carrier being in the form of particles about 5 to 40 microns in size composed of a magnetic fine powder dispersed in an insulating resin and containing the magnetic fine powder in a proportion of about 50 to 75% by weight, said toner and carrier adhering onto different image portions of said electrostatic latent image; and a third step of transferring the developed image onto a transfer paper.

4,562,130

METHOD OF FORMING COMPOSITE IMAGES

Tateki Oka, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 15, 1983, Ser. No. 532,594

Claims priority, application Japan, Sep. 28, 1982, 57-169990; Dec. 29, 1982, 57-228553; Jan. 11, 1983, 58-3216

Int. Cl.⁴ G03G *13/22*

U.S. Cl. 430—54 **17 Claims**

1. A method of forming composite images comprising a step of forming a first electrostatic latent image by exposing a uniformly charged photosensitive surface to an image for producing a first part of the image having a first potential corresponding to an image area and leaving a non-image area at a second unstable potential, a step of charging by a scorotron charger to correct only the second potential to a higher stable potential between the first and second potentials without altering said first potential, and a step of forming a second electrostatic latent image by exposing the higher potential nonimage area to another part of said composite image.

4,562,131

PHOTORECEPTOR CONTAINING A TRISAZO COMPOUND FOR USE IN ELECTROPHOTOGRAPHY

Osamu Sasaki; Naohiro Hirose, both of Hachioji, and Kiyoshi Sawada, Hino, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

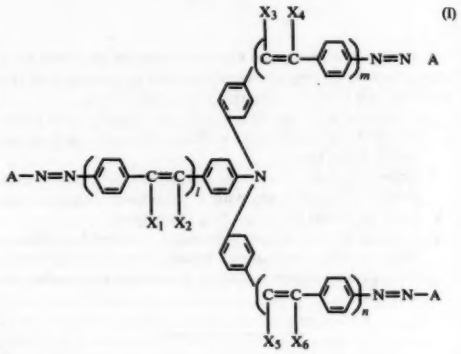
Filed May 4, 1984, Ser. No. 607,200

Claims priority, application Japan, May 6, 1983, 58-79607

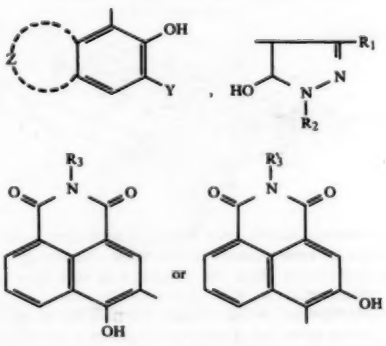
Int. Cl.⁴ G03G *5/06*

U.S. Cl. 430—58 **14 Claims**

1. A photoreceptor comprising a photosensitive layer and an electrically conductive support, wherein the photosensitive layer comprises a compound represented by the following formula (I):



wherein X_1, X_2, X_3, X_4, X_5 and X_6 are each a hydrogen atom, a halogen atom or a cyano group; l, m and n are each 0 or 1, provided that at least one of l, m and n is 1; and A is



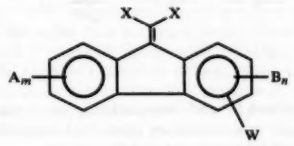
wherein Y is a hydrogen atom, a hydroxy group, a carboxyl group or its ester group, a sulfo group, a carbamoyl group, or a sulfamoyl group; Z is an atomic group necessary for constituting an aromatic carbon ring or an aromatic heteroring; R_1 is a hydrogen atom, an alkyl group, an amino group, a carboxyl group or its ester group, a carbamoyl group, or a cyano group; R_2 is an aryl group; and R_3 is an alkyl group, an aralkyl group or an aryl group.

4,562,132
PHOTORESPONSIVE IMAGING MEMBERS CONTAINING ELECTRON TRANSPORT OVERCOATINGS

Beng S. Ong, Mississauga; Barkev Keoshkerian, Willowdale; Dasarao K. Murti, Mississauga, all of Canada, and Joseph Mammino, Penfield, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 19, 1984, Ser. No. 672,749
Int. Cl.⁴ G03G 5/14
U.S. Cl. 430—59 **31 Claims**

1. An imaging member comprised of a supporting substrate, a hole transport layer comprised of an arylamine hole transporting compound dispersed in an inactive resinous binder, a photogenerating layer comprised of a photogenerating pigment optionally dispersed in a resinous binder, and as a protective topcoating an electron transporting layer compound of the following formula dispersed in a resinous binder



where X is cyano or alkoxycarbonyl groups, A and B are electron withdrawing groups, m is a number of from 0 to 2, n is the number 0 or 1, and W is an electron withdrawing group selected from the groups consisting of acyl (COR), alkoxycarbonyl (COOR), alkylaminocarbonyl (CONHR), and derivatives thereof.

4,562,133
POLYMERS PHOTOCONDUCTIVE IN THE NEAR INFRA-RED

Almeria Natansohn, Ashdod, Israel, assignor to Yeda Research and Development Company Limited, Rehovot, Israel

Filed Oct. 4, 1984, Ser. No. 657,879
Claims priority, application Israel, Oct. 13, 1983, 69958
Int. Cl.⁴ G03G 5/07
U.S. Cl. 430—80 **11 Claims**

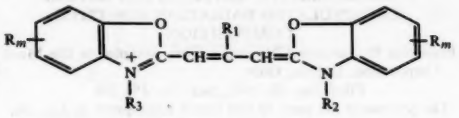
1. A photoconductive compound being a copolymer having a maximum photocurrent in the near IR region and comprising a polymeric backbone to which there are attached 3-substituted N-alkyl carbazole groups and 3,5-dinitrobenzoic acid moieties, the attachment of said moieties being directly or via suitable spacer moieties.

4,562,134
ELECTROPHOTOGRAPHIC MATERIAL WITH CYANINE SENSITIZER WITH BETAINE GROUP

Werner Franke, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 29, 1984, Ser. No. 614,823
Claims priority, application Fed. Rep. of Germany, May 31, 1983, 3319654
Int. Cl.⁴ G03G 5/09
U.S. Cl. 430—83 **13 Claims**

1. An electrophotographic recording material, comprising: an electrically conductive support layer, and at least one photoconductive layer applied thereto which comprises (a) an organic photoconductor selected from the group consisting of an oxadiazole, an oxazole photoconductor, and derivatives thereof, (b) at least one sensitizing dye, and (c) a binder, wherein the sensitizing dye contained in the photoconductive layer comprises a compound corresponding to the formula:



wherein
R is chlorine or bromine,
m is 1 or 2,
R_1 is an alkyl group having from 1 to 3 carbon atoms,
R_2 is $-(CH_2)_n-SO_3H$ or $-(CH_2)_2-COOH$,
R_3 is $-(CH_2)_n-SO_3^-$ or $-(CH_2)_2-COO^-$ and
n is 3 or 4.

4,562,135
POSITIVELY CHARGED COLOR TONER COMPOSITIONS

Francoise M. Winnik, Toronto, and Trevor I. Martin, Burlington, both of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 13, 1984, Ser. No. 630,463
Int. Cl.⁴ G03G 9/08
U.S. Cl. 430—106 **55 Claims**

1. A dry positively charged colored toner composition comprised of resin particles, and a dye charge control composition represented by the following formula:

X—A—C

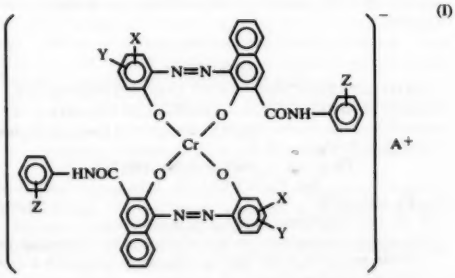
wherein X is a chromophore molecule, A is a saturated alkylene group, and C is a triboelectric charge establishing group.

4,562,136
TWO-COMPONENT DRY-TYPE DEVELOPER

Satoru Inoue, Mishima; Mitsuru Uchida, Susono; Kimitoshi Yamaguchi, Numazu; Mitsuo Aoki, Numazu; Masami Tomita, Numazu, and Chiaki Uematsu, Fuji, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 471,387, Mar. 2, 1983, abandoned. This application Nov. 7, 1984, Ser. No. 669,749
Claims priority, application Japan, Mar. 5, 1982, 57-033979; Apr. 24, 1982, 57-068075; May 17, 1982, 57-081571
Int. Cl.⁴ G03G 9/08
U.S. Cl. 430—107 **14 Claims**

1. A two component dry type developer comprising carrier particles coated with a silicone resin and toner particles containing as a negative polarity control agent a monoazo metal complex dye of the formula



(I)

wherein X, Y and Z independently represent hydrogen, halogen, carboxy, hydroxy, nitro, sulfo or sulfonamide, and A^+ represents H^+, NH_4^+, K^+, Na^+ or an aliphatic ammonium cation.

4,562,137

PHOTOSENSITIVE MATERIAL EMPLOYING ENCAPSULATED RADIATION SENSITIVE COMPOSITION

Frederick W. Sanders, Chillicothe, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Dec. 30, 1982, Ser. No. 454,396

The portion of the term of this patent subsequent to Aug. 16, 2000, has been disclaimed.

Int. Cl.⁴ G03C *1/40, 1/00*

U.S. Cl. 430—138 **29 Claims**

1. A photosensitive material comprising a support having on a surface thereof a plurality of capsules, said capsules containing, as the internal phase, a radiation sensitive composition which undergoes a change in viscosity upon exposure to actinic radiation, the sensitivity (log E) of said photosensitive material being less than 4.0 wherein upon exposing said material to actinic radiation and rupturing said capsules, said internal phase is image-wise released from said capsules and participates in forming a image.

4,562,138

NITROGEN-CONTAINING HETEROCYCLIC BLOCKED MERCAPTO DEVELOPMENT INHIBITORS

Morito Uemura, and Kaoru Onodera, both of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

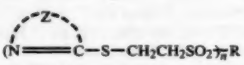
Continuation of Ser. No. 450,005, Dec. 15, 1982, abandoned, which is a continuation of Ser. No. 138,931, Apr. 10, 1980, abandoned. This application Aug. 21, 1984, Ser. No. 642,695

Claims priority, application Japan, Apr. 17, 1979, 54-46841; Apr. 17, 1979, 54-46842

Int. Cl.⁴ G03C *5/54, 1/40, 1/34*

U.S. Cl. 430—219 **11 Claims**

1. A photographic material which comprises at least one photosensitive silver halide emulsion layer and a development inhibitor releasing compound represented by the following formula;



wherein Z represent non-metallic atoms necessary for forming a 5- or 6-membered heterocyclic ring, n represents an integer of 1 or 2 and R represents an alkyl, phenyl, alkylene or phenylene group provided that when n is 1, R represents an alkyl or phenyl group and when n is 2, R represents an alkylene or phenylene group.

9. A photographic material according to claim **1** wherein said photographic material further comprises a dye image forming substance.

10. A photographic material according to claim **9** wherein said photographic material further comprises an image-receiving layer.

4,562,139

PHOTOGRAPHIC PRODUCTS EMPLOYING NOVEL NONDIFFUSIBLE METAL COMPLEXES OF AZO DYES

James A. Reczek, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 2, 1985, Ser. No. 688,203

Int. Cl.⁴ G03C *1/40, 5/54*

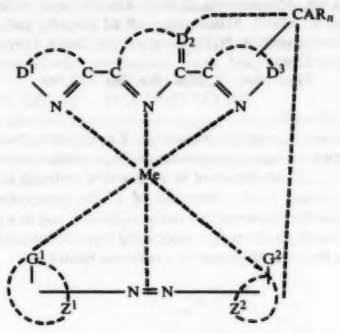
U.S. Cl. 430—223 **23 Claims**

12. In a photographic assemblage comprising:

(i) a support having thereon at least one photosensitive silver halide emulsion layer having associated therewith a dye image-providing material;

(ii) a dye image-receiving layer; and

(iii) an alkaline processing composition and means containing same for discharge within said assemblage; said assemblage containing a silver halide developing agent; the improvement wherein said dye image-providing material is a nondiffusible compound capable of releasing at least one diffusible dye moiety having the formula:



wherein:

(a) D^1, D^2 and D^3 each independently represents the atoms necessary to complete an aromatic heterocyclic nucleus having at least one ring of 5 to 7 atoms;

(b) Z^1 and Z^2 each independently represents the atoms necessary to complete an aromatic carbocyclic or heterocyclic nucleus having at least one ring of 5 to 7 atoms or a ketomethine group;

(c) G^1 and G^2 each independently represents a metal chelating group;

(d) Me is a polyvalent, hexacoordinate metal ion,

(e) CAR represents a ballasted carrier moiety capable of releasing said diffusible dye moiety as a function of development of said silver halide emulsion layer under alkaline conditions; and

(f) n is 1, 2 or 3.

4,562,140

PHOTOSENSITIVE MATERIAL FOR USE IN DIFFUSION TRANSFER PROCESS WITH MATTING AGENTS IN UNDERLAYER

Isao Kohmura; Jun Miura, and Norio Kajima, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Oct. 11, 1984, Ser. No. 659,887

Claims priority, application Japan, Oct. 19, 1983, 58-195841

Int. Cl.⁴ G03C *5/54, 1/96*

U.S. Cl. 430—244 **10 Claims**

1. A photosensitive material for diffusion transfer process which comprises a support and at least an undercoating layer and a silver halide emulsion layer provided on said support, said undercoating layer containing a hydrophilic binder and a matting agent having an average particle size larger than the thickness of the undercoating layer.

6. A diffusion transfer process which comprises imagewise exposing the photosensitive material according to claim **1** and then diffusion transfer developing the material in contact with an image receiving layer.

4,562,141

POLYMERISABLE COMPOSITION COMPRISING CONJUGATED DIACETYLENIC COMPOUNDS, MATERIAL COATED THEREWITH AND THE USE THEREOF

Bernd Tieke, Freiburg, Fed. Rep. of Germany, assignor to Ciba Geigy Corporation, Ardsley, N.Y.

Filed Sep. 21, 1983, Ser. No. 534,523

Claims priority, application Switzerland, Sep. 29, 1982, 5776/82

Int. Cl.[4] G03C *1/68, 1/70;* C08F *38/00*

U.S. Cl. 430—281 9 Claims

1. A composition which is polymerizable by radiation and is based on conjugated diacetylene compounds and contains (a) a diyne compound of the formula I

$$H(CH_2)_m—C\equiv C—C\equiv C—(CH_2)_n—A \quad (I)$$

in which m and n independently of one another are 0 or an integer from 1 to 30 and the sum of m+n is at least 10, n being at least 1, if the group A is not linked to the diyne radical via a C atom, and A is a polar group, and (b1) at least one compound of the formula I which is different from (a), (b2) an unsubstituted alkane having 10 to 30 C atoms or (b3) a surface-active dye containing at least one alkyl group which contains at least 10 C atoms and which is attached to a chromophoric molecule.

4,562,142

AQUEOUS ALKALI DEVELOPABLE PHOTOSENSITIVE COMPOSITION AND PHOTOSENSITIVE LAMINATE

Hajime Kakumaru, and Nobuyuki Hayashi, both of Hitachi, Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 442,111, Nov. 16, 1982, abandoned. This application Sep. 28, 1984, Ser. No. 655,435

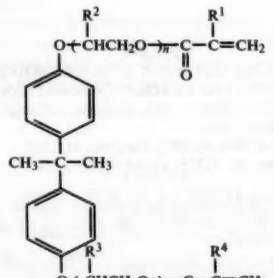
Claims priority, application Japan, Nov. 20, 1981, 56-187333

Int. Cl.[4] G03C *1/68*

U.S. Cl. 430—288 11 Claims

1. A photosensitive composition, developable by aqueous alkali solution, consisting essentially of:

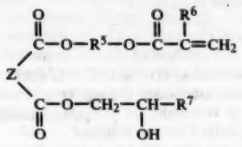
30 to 60 parts by weight of (a) an addition-polymerizable compound of the general formula (I):



(I)

wherein R^1, R^2, R^3 and R^4 are the same or different and each is hydrogen atom or methyl group, and n and m are a positive integer, provided than n+m=8 to 12, and

(b) 5 to 15 parts by weight of an addition-polymerizable compound of the general formula (II):



(II)

wherein Z is a cyclic dibasic acid residue, R^5 is an alkyl group having 1 to 3 carbon atoms, R^6 is hydrogen atom or methyl group, and R^7 is hydrogen atom, methyl group, ethyl group or CH_2X in which X is chlorine atom or bromine atom,

0.5 to 10.0 parts by weight of (c) a photoactivatable polymerization initiator, and

40 to 70 parts by weight of (d) a linear copolymer having a carboxy content of 17 to 50% by mole, a water absorption of 4 to 30% by weight and a weight average molecular weight of 30,000 to 400,000.

4,562,143

METHOD OF FORMING IMAGE BY MEANS OF HEAT DEVELOPMENT

Shigeto Hirabayashi; Toyoaki Masukawa, and Wataru Ishikawa, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 400,928, Jul. 22, 1982, abandoned. This application Jul. 20, 1984, Ser. No. 633,063

Claims priority, application Japan, Jul. 31, 1981, 56-121043

Int. Cl.[4] G03C *5/24*

U.S. Cl. 430—353 7 Claims

1. A method of forming an image by heat development of a heat developable photosensitive material comprising a support and a heat developable photosensitive layer thereon comprising imagewise exposing said photosensitive layer, then bringing a non-water-permeable layer into close contact with said photosensitive layer, and heat developing said photosensitive layer,

said photosensitive layer comprising

(a) an organic acid silver salt;

(b) a photosensitive silver halide;

(c) a reducing agent; and

(d) a binder containing at least one of gelatin and a gelatin derivative;

said non-water-permeable layer comprising a high molecular compound selected from the group consisting of polyethylene, polypropylene, polystyrene, polyvinyl acetate, polyvinyl butyral, polyvinyl acetal, polyvinyl fluoride, polyvinyl pyrrolidone, polyvinyl chloride, polyacrylic ethyl, polymethacrylic methyl, polymethacrylic ethyl, polyvinylidene chloride, chlorinated polyethylene, chlorinated polypropylene, polycarbonate, polybutadiene, cellulose acetate, cellulose acetate butyrate, cellulose acetate propionate, ethyl cellulose, benzyl cellulose, cellulose acetate phthalate, polyethylene terephthalate, fluorine-containing polymer, and polyamide.

4,562,144

IMAGE STABILIZER FOR SILVER HALIDE PHOTOGRAPHIC MATERIAL

Masayuki Kurematsu, Hachioji, and Shigeharu Koboshi, Sagamihara, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 460,988, Jan. 25, 1983, abandoned. This application Oct. 17, 1984, Ser. No. 661,289

Claims priority, application Japan, Feb. 5, 1982, 57-17333

Int. Cl.[4] G03C *5/38*

U.S. Cl. 430—372 8 Claims

1. A method of treating an exposed silver halide photographic material, after bleaching or bleach-fixing, comprising the step of treating said photographic material containing a dye

image with an aqueous stabilizing solution which contains a water-soluble bismuth compound.

4,562,145

PHOTOGRAPHIC BASE PAPERS

Antony I. Woodward, Amersham; George Tyler, Prestwood, and John Lovick, High Wycombe, all of England, assignors to The Wiggins Teape Group Limited, England

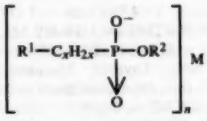
Continuation of Ser. No. 284,140, Jul. 7, 1981, abandoned, which is a continuation of Ser. No. 138,322, Apr. 8, 1980, abandoned. This application Jun. 20, 1983, Ser. No. 505,842

Claims priority, application United Kingdom, Apr. 20, 1979, 7913740

Int. Cl.⁴ G03C *1/76*

U.S. Cl. 430—538 **26 Claims**

1. A base paper suitable for use in photographic prints having a polyolefin resin coating which contains a substantially nonmigratory stabilizer having been directly incorporated into the polyolefin resin and which is of the following structural formula:



wherein R^1 is a sterically hindered hydroxyphenyl, R^2 is C_1–C_{12} alkyl, and x is 1 to 4, M is hydrogen or a metal cation and n is 1 to 4 and equal to the valency of M, the coating also containing a titanium pigment and a light stabilizer.

4,562,146

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Kosaku Masuda, Akishima; Kaoru Miyagi, Tachikawa; Katsunori Katoh; Noritaka Nakayama, both of Hachioji; Toshihiko Kimura, Hino, and Satoshi Kawakatsu, Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

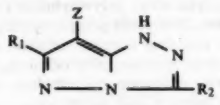
Filed Nov. 16, 1984, Ser. No. 672,143

Claims priority, application Japan, Nov. 18, 1983, 58-217339

Int. Cl.⁴ G03C *7/38*

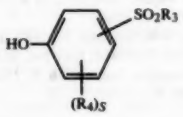
U.S. Cl. 430—546 **16 Claims**

1. A silver halide color photographic material containing a photographic magenta coupler of formula (I) and a phenolic compound of formula (II) within a silver halide emulsion layer:



(I)

(wherein R_1 and R_2 are each an alkyl group or an aryl group; Z is a hydrogen atom or a group that can be eliminated upon coupling reaction with the oxidized product of a color developing agent);



(II)

(wherein R_3 is an alkyl group, an alkoxy group, an aryl group or an amino group; R_4 is an alkyl group, an alkoxy group or a halogen atom; s is an integer of 0 to 2, provided that when s is 2, R_4 may be the same or different).

4,562,147

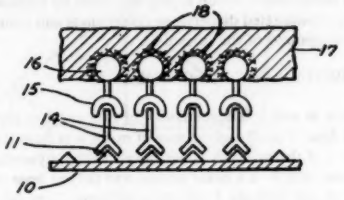
METHOD AND KIT FOR DIAGNOSIS OF PSEUDORABIES

Han S. Joo, St. Paul, Minn., assignor to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Jun. 13, 1983, Ser. No. 503,824

Int. Cl.⁴ C12Q *1/70*; G01N *33/54*; B65D *71/00*

U.S. Cl. 435—5 **19 Claims**



1. A method of diagnosing pseudorabies in animals by detecting antibodies to pseudorabies virus which comprises:

(A) placing a sample of blood or blood serum drawn from an animal in the sample well of a test plate comprising:

(1) a receptacle having a flat supporting surface,

(2) a coating adsorbed on said surface of solubilized non-infectious swine pseudorabies virus antigen, said coating including an adhesion promoting carbonate coating buffer,

(3) a layer of agar overlying said antigen coating, and

(4) at least one sample receiving well extending through the agar layer,

(B) incubating said samples to bind antibodies from the sample to the antigen layer,

(C) removing the agar layer and washing the antigen layer with bound pseudorabies virus antibodies,

(D) applying a conjugate, an enzyme conjugated anti-swine immunoglobulin, to said bound antibodies, incubating to bind the conjugate to the antibodies, and washing to remove excess conjugate,

(E) applying an agar layer containing a color producing substrate for the enzyme of the conjugate over the bound conjugate,

(F) visually measuring the diameter of the resulting colored reaction zone and comparing with a table of standard values.

4,562,148

ANALYTICAL ELEMENT AND METHOD FOR PREVENTING REAGENT MIGRATION

Ronald G. Sommer, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Nov. 6, 1981, Ser. No. 318,755

Int. Cl.⁴ G01N *33/54*; C12Q *1/54*

U.S. Cl. 435—7 **19 Claims**

1. A method for preparing an analytical element useful for evaluation of a liquid sample for the presence of an analyte, comprising the steps of

incorporating a single analyte detection layer with an aqueous solution of at least one reagent of an analyte detecting system, and a buffer capable of providing a pH of at least 5,

drying the single analyte detection layer, and

incorporating the dried single analyte detection layer with a solution comprising a solvent, any reagent or reagents other than said at least one reagent contained in said analyte detecting system, and an unionized ionizable reagent migration inhibiting substance selected from the group

consisting of carboxylic acid polymers and sulfonic acid polymers, wherein said solvent is one in which the substance is insoluble in its ionized state, but soluble in its unionized state.

4,562,149

YEAST CULTURE CONTAINING S-ADENOSYL METHIONINE IN HIGH CONCENTRATIONS, AND PROCESS FOR PRODUCTION OF S-ADENOSYL METHIONINE

Shozo Shiozaki; Hideaki Yamada; Yoshiki Tani, and Sakayu Shimizu, all of Kyoto, Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Feb. 4, 1983, Ser. No. 463,990

Claims priority, application Japan, Feb. 25, 1982, 57-29660; Feb. 26, 1982, 57-28893

Int. Cl.⁴ C12P *13/12, 19/32;* C12N *1/16, 1/18*

U.S. Cl. 435—88 16 Claims

1. A substantially biologically pure culture of yeast of the genus Saccharomyces which contains at least 10% S-adenosyl methionine by weight, based on the dry cell weight of the culture, and being substantially free of methylthioadenosine.

9. A process for producing S-adenosyl methionine, which comprises cultivating a yeast microorganism belonging to the genus Saccharomyces having the ability to produce S-adenosyl methionine at a temperature of 15° to 45° C. under aerobic conditions in a liquid culture medium at a pH of from 3 to 8 and containing an effective amount of methionine to obtain the cells containing at least 10% S-adenosyl methionine by weight based on the dry yeast cells, and being substantially free of methylthioadenosine, separating the yeast cells from the culture medium and thereafter obtaining S-adenosyl methionine in a stable form from the yeast cells.

4,562,150

METHOD FOR MANUFACTURE OF CELLULASE

Takashi Yamanobe; Yasushi Mitsuishi, both of Ibaraki, and Yoshiyuki Takasaki, Matsudo, all of Japan, assignors to Agency of Industrial Science and Technolgy and Ministry of International Trade and Industry, both of Tokyo, Japan

Filed Mar. 6, 1984, Ser. No. 586,723

Claims priority, application Japan, Mar. 9, 1983, 58-38432; Mar. 9, 1983, 58-38433; Mar. 9, 1983, 58-38434

Int. Cl.⁴ C12P *19/14;* C12N *9/42;* C12R *1/75*

U.S. Cl. 435—99 3 Claims

1. A method for the manufacture of cellulase comprising the steps of culturing *Acremonium cellulolyticus* FERM P-6867 in a culture medium containing a carbon source, a nitrogen source, and a small amount of metal salt.

4,562,151

STABILIZATION OF L-PHENYLALANINE AMMONIA-LYASE ENZYME

Ganesh M. Kishore, St. Peters, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Sep. 6, 1983, Ser. No. 529,434

Int. Cl.⁴ C12P *13/22, 13/06, 13/00;* C12N *9/96, 9/88*

U.S. Cl. 435—108 18 Claims

1. A process for the synthesis of L-phenylalanines and analogues thereof which comprises reacting trans-cinnamate, ring-substituted trans-cinnamates or acrylate derivatives and ammonia or an ammonia donor in the presence of L-phenylalanine ammonia-lyase enzyme and a polyhydric alcohol or polyethelene glycol-(400).

4,562,152

PROCESS FOR OBTAINING PURE L-LEUCINE

Axel Kleemann, Hanau; Jürgen Martens, Alzenau, and Horst Weigel, Rodenbach, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed May 22, 1984, Ser. No. 612,802

Claims priority, application Fed. Rep. of Germany, May 25, 1983, 3318932

Int. Cl.⁴ C12P *13/06;* C07P *41/00*

U.S. Cl. 435—116 8 Claims

1. A process of obtaining pure L-leucine from an aminocarboxylic acid mixture containing at least 45 weight percent L-leucine, at most 40 weight percent L-isoleucine and at most 25 weight percent of other aminocarboxylic acids, in each case based on the dry material comprising:

(a) acetylating the aminoacid mixture,

(b) precipitating a mixture of N-acetylaminoacids enriched in N-acetyl-L-leucine from the crude mixture of acetylation products,

(c) subjecting this N-acetyl-L-leucine enriched mixture in aqueous solution having a concentration between 0.1 and 1.5 moles/l of N-acetyl-L-leucine at a pH between 6 and 8 and a temperature between 10° and 40° C. in the presence of an effector of hydrolysis by a L-aminoacid acylase until 30 to 95% of the N-acetyl-L-leucine is hydrolyzed to the free aminoacid, and

(d) isolating pure L-leucine from the crude hydrolysis mixture.

4,562,153

PROCESS FOR THE SEPARATION OF L-LEUCINE AND L-ISOLEUCINE

Axel Kleemann, Hanau; Jürgen Martens, Alzenau, and Horst Weigel, Rodenbach, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed May 22, 1984, Ser. No. 612,803

Claims priority, application Fed. Rep. of Germany, May 25, 1983, 3318933

Int. Cl.⁴ C12P *13/06;* C07P *41/00*

U.S. Cl. 435—116 8 Claims

1. A process of separating L-leucine and L-isoleucine in an aminocarboxylic acid mixture containing 30 to 65 weight percent L-leucine, 35 to 70 weight percent L-isoleucine and at most 35 weight percent of other aminocarboxylic acids, in each case based on the dry material comprising:

(a) acetylating the aminoacid mixture,

(b) precipitating a mixture of N-acetylaminoacids enriched in N-acetyl-L-leucine and N-acetyl-L-isoleucine from the crude mixture of acetylation products,

(c) subjecting this enriched mixture in aqueous solution having a total concentration between 0.1 and 1.5 moles/l of acetylaminoacids at a pH between 6 and 8 and a temperature between 10° and 40° C. in the presence of an catalyst to hydrolysis by a L-aminoacid acylase until 25 to 95% of the N-acetyl-L-leucine is hydrolyzed to the free aminoacid,

(d) crystallizing pure L-leucine from the crude hydrolysis mixture and separating the L-leucine,

(e) isolating N-acetyl-L-isoleucine from the the mother liquor remaining after the separation of the L-leucine, and

(f) hydrolyzing the N-acetyl-L-isoleucine to the free aminoacid.

4,562,154

CONTINUOUS ALCOHOL MANUFACTURING PROCESS USING YEAST

Keiichiro Watanabe; Tomiaki Yamada, both of Yokohama; Tsuneo Sazanami, Yokosuka, and Eiko Asahara, Kiyose, all of Japan, assignors to JGC Corporation, Tokyo and Kansai Paint Co., Ltd., Amagasaki, both of, Japan

Continuation of Ser. No. 266,866, May 26, 1981, abandoned. This application Aug. 11, 1983, Ser. No. 522,545
Claims priority, application Japan, May 28, 1980, 55-70943
Int. Cl.[4] C12P *7/14*
U.S. Cl. 435—162 5 Claims

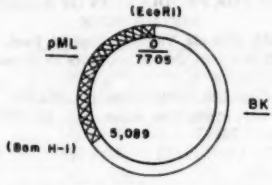
1. A continuous fermentation process for producing ethanol, which consists essentially of: introducing a stream of a fermentable sugar-containing feed liquor containing at least 23–27 wt./V% of sugar into a first fermentation zone containing viable yeast cells consisting essentially of cells of Yeast A immobilized on a photocross-linked resin carrier, and carrying out a first fermentation of said feed liquor to partially convert the sugar therein to ethanol and to produce a first effluent liquor containing ethanol and sugar, said Yeast A being capable of rapidly fermenting sugar contained in said feed liquor to produce ethanol and being superior in sugar resistance relative to a Yeast B so that Yeast A can ferment the sugar in said liquor when said liquor contains more than about 23–27 wt./V% of sugar, and said Yeast A being selected from the group consisting of *Saccharomyces rouxii, Zygosaccharomyces japonicus, Zygosaccharomyces majar* and *Zygosaccharomyces soya;* introducing a stream containing said first effluent liquor into a second fermentation zone containing viable yeast cells consisting essentially of cells of Yeast B immobilized on a photocross-linked resin carrier, and carrying out a second fermentation of said first effluent liquor to convert a further quantity of the sugar contained therein to ethanol and to produce a second effluent liquor containing ethanol and sugar, said Yeast B being inferior in sugar resistance relative to Yeast A and being capable of rapidly fermenting sugar contained in a fermentable sugar-containing liquor to produce ethanol under the conditions that said liquor contains up to about 23–27 wt./V% of sugar and up to about 15–17 vol.% of ethanol, said Yeast B being selected from the group consisting of *Saccharomyces cerevisiae, Saccharomyces formosensis, Saccharomyces robustus* and *Saccharomyces carlsbergensis;* introducing a stream containing said second effluent liquor into a third fermentation zone containing viable yeast cells consisting essentially of cells of Yeast C immobilized on a photocross-linked resin carrier, and carrying out a third fermentation of said second effluent liquor to convert an additional quantity of the sugar contained therein to ethanol, said Yeast C being capable of rapidly fermenting sugar contained in said second effluent liquor to produce ethanol and being superior in alcohol resistance relative to Yeast B so that Yeast C can ferment the sugar in said second effluent when said liquor contains more than about 15–17 vol.% of ethanol, and Yeast C being selected from the group consisting of *Schizosaccharomyces pombo, Schizosaccharomyces octosporus* and *Schizosaccharomyces mellacei;* and recovering an ethanol-containing broth containing at least about 18 vol.% of ethanol from said third fermentation zone.

4,562,155

HYBRID VIRAL PLASMID AND MICROORGANISMS CONTAINING SAME

Robert P. Ricciardi, Philadelphia, Pa.; Giuseppe Barbanti-Brodano, Bologna, and Gabriele Milanesi, Pavia, both of Italy, assignors to The Wistar Institute of Anatomy and Biology, Philadelphia, Pa.

Filed May 19, 1983, Ser. No. 496,000
Int. Cl.[4] C12N *15/00, 5/00, 1/20, 1/00*
U.S. Cl. 435—172.3 23 Claims



1. *E. coli* HB101 (pML BK) having the deposit accession number ATCC 39370.

4,562,156

MUTANT MICROORGANISM AND ITS USE IN REMOVING ORGANIC SULFUR COMPOUNDS

Jenefir D. Isbister, Potomac, Md., and Richard C. Doyle, Fairfax, Va., assignors to Atlantic Research Corporation, Alexandria, Va.

Filed Jul. 11, 1983, Ser. No. 512,857
Int. Cl.[4] C12N *1/20*
U.S. Cl. 435—253 4 Claims

1. A biologically pure culture of mutant Pseudomonas sp. CB1 ATCC #39381.

2. A process for removing organic sulfur compounds from a carbonaceous substrate comprising treating said substrate with a culture of Pseudomonas sp. CB1 ATCC #39381.

4,562,157

DIAGNOSTIC DEVICE INCORPORATING A BIOCHEMICAL LIGAND

Christopher R. Lowe, Newmarket, and Fergus G. P. Earley, Solihull, both of England, assignors to National Research Development Corporation, London, England

Filed May 25, 1984, Ser. No. 614,121
Claims priority, application United Kingdom, May 25, 1983, 8314523
Int. Cl.[4] C12M *1/34;* G01N *33/54*
U.S. Cl. 435—291 18 Claims

1. A device for diagnostics comprising:

a sensor having a surface to which a biochemical ligand is attached covalently, in a manner effective to cause a physical characteristic of the sensor to vary according to whether a binding partner becomes bound to the ligand, wherein the biochemical ligand is attached covalently to the surface of the sensor in selected areas only thereof and through a photoactivated covalent linkage.

4,562,158

SOLID PHASE SCINTILLATION COUNTING METHOD

Karl A. Schellenberg, Virginia Beach, a., assignor to Eastern Virginia Medical Authority, Norfolk, Va.

Filed Jul. 27, 1981, Ser. No. 286,926
Int. Cl.[4] G01T *1/20*
U.S. Cl. 436—57 15 Claims

1. A solid state scintillation counting method comprising the steps of

contacting a carrier with a detergent,

contacting said carrier with a radioactive substance,
applying a scintillating material to said carrier and
counting scintillations of the material applied to said carrier in a liquid scintillation counter, said carrier being impregnated with the scintillating material, the radioactive substance and the detergent at the time of the counting.

4,562,159

DIAGNOSTIC TEST FOR HEPATITIS B VIRUS

David A. Shafritz, Larchmont, N.Y., assignor to Albert Einstein College of Medicine, A Division of Yeshiva Univ., Bronx, N.Y.

Filed Mar. 31, 1981, Ser. No. 249,369
Int. Cl.[4] C12N *15/00;* **G01N** *33/50*
U.S. Cl. 436—501 **36 Claims**

1. A method for detecting the presence of hepatitis B virus in a test specimen containing at least a portion of the DNA sequence of the hepatitis B virus consisting essentially of
affixing the test specimen suspected to contain said hepatitis B virus DNA directly on a substrate,
incubating the test specimen in contact with a reagent comprising cloned hepatitis B virus DNA containing label for detecting the presence of said cloned DNA, said hepatitis B virus DNA having been purified by reisolation from a cloning vector,
treating said substrate bearing the affixed test specimen with a solution which digests all protein while leaving the nucleic acid affixed to said substrate, prior to conducting said incubating step,
conducting said incubation under conditions which permit the labelled purified, cloned hepatitis B virus DNA to combine with the unlabelled hepatitis B virus DNA of the test specimen,
removing uncombined purified hepatitis B virus DNA from the substrate, and
reading the substrate to detect the presence of said label.

26. A method for the detection of a known DNA sequence comprising at least about 200 nucleotide base pairs in a biological sample consisting essentially of
affixing a biological sample to be tested for the presence of said known DNA sequence to a substrate,
treating said substrate bearing said sample to remove all protein thereon and to leave nucleic acid affixed to said substrate,
contacting said sample with a hybridization probe comprising cloned DNA containing said sequence, said cloned DNA having been repurified by reisolation from a cloning vector, said purified DNA including a detectable label,
incubating said probe in contact with said sample under hybridization conditions which permit the labeled DNA to hybridize with only DNA containing said nucleotide sequence,
removing from said substrate the labeled DNA that has not hybridized with the DNA in said sample, and
analyzing said substrate for the presence of said label.

4,562,160

MELANOMA TUMOR ANTIGEN AND AUTOLOGOUS ANTIBODY

Francisco X. Real, New York; M. Jules Mattes, Jamaica Estates; Alan N. Houghton; Philip O. Livingston, both of New York; Kenneth O. Lloyd, Bronx, all of N.Y.; Herbert F. Oettgen, New Canaan, Conn., and Lloyd J. Old, New York, N.Y., assignors to Sloan-Kettering Institute, New York, N.Y.

Filed Apr. 1, 1983, Ser. No. 482,153
Int. Cl.[4] G01N *33/54;* **A61K** *39/395, 39/44, 43/00*
U.S. Cl. 436—539 **9 Claims**

4. A method of detecting the presence or lack of Class 1 FD gp 90 melanoma cell antigen comprising mixing a cell extract thought to contain said antigen with a human serum sample containing antibody which specifically binds to said antigen and incubating under conditions favoring formation of a complex of Class 1 FD gp 90 melanoma cells antigen and antibody specifically binding to said antigen, and determining whether or not a complex of said Class 1 FD gp 90 antigen and antibody specifically binding to said antigen has formed.

9. Class 1 FD gp 90 melanoma cell antigen purified from human melanoma cells.

4,562,161

OPTICAL AND OPHTHALMIC GLASS WITH REFRACTIVE INDICES GREATER THAN OR EQUAL TO 1.56, ABBE NUMBERS GREATER THAN OR EQUAL TO 40 AND DENSITIES LESS THAN OR EQUAL TO 2.70 G/CM^3

Karl Mennemann, Taunusstein; Georg Gliemeroth, Mainz-Finthen; Ludwig Ross, Klein-Winternheim; Burkhard Speit, Mainz-Mombach; Volkmar Geiler, Mainz-Finthen; Hans-Georg Krolla, Mainz, and Lothar Meckel, Oestrich-Winkel, all of Fed. Rep. of Germany, assignors to Schott Glaswerke, Mainz, Fed. Rep. of Germany

Filed Feb. 18, 1983, Ser. No. 467,722
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1982, 3206226; Feb. 20, 1982, 3206227
Int. Cl.[4] C03C *3/08*
U.S. Cl. 501—59 **12 Claims**

1. An optical and ophthalmic glass with a refractive index greater than or equal to 1.56, an Abbe number greater than or equal to 40 and a density less than or equal to 2.70 g/cm^3, consisting essentially of (in % by weight):
SiO_2—49–68
B_2O_3—3–8
Al_2O_3—0.5–3
P_2O_5—0–1.5
sum of SiO_2, B_2O_3, Al_2O_3 and P_2O_5—60–78
Li_2O—3–8
Na_2O—4–10
K_2O—0–10
sum of M_2O (M = Li, Na, K)—9–17
CaO—2–6
MgO—0–3
SrO—0–4
BaO—0–4
ZnO—0–2.97
TiO_2—5–12.8
ZrO_2—0–6
Nb_2O_5—0.15–5
F——0–5
sum of CaO, MgO, SrO, BaO, ZnO—1.5–6
Y_2O_3—0–3.

4,562,162

GLASS FOR MULTI-FOCAL EYEGLASS LENS

Hiroji Sagara, Tokyo, Japan, assignor to Hoya Corporation, Tokyo, Japan

Filed Oct. 26, 1984, Ser. No. 665,388
Claims priority, application Japan, Oct. 27, 1983, 58-200079
Int. Cl.[4] C03C *3/102, 3/07, 3/072, 4/00*
U.S. Cl. 501—60 **1 Claim**

1. A glass for a multi-focal eyeglass having a refractive index (n_d) of 1.67 to 1.73, an Abbe number (ν_d) of 33 or more, a coefficient of thermal expansion of 82 to 95×10^{-7} and a softening point of 560° to 640° C., consisting of, in % by weight,
32 to 40% $SiO_2 + B_2O_3 + Al_2O_3$;
22 to 40% SiO_2;
0 to 10% B_2O_3;
0 to 4% Al_2O_3;
4 to 10% $Li_2O + Na_2O + K_2O$;
0 to 4% Li_2O;
0 to 7% Na_2O;
0 to 7% K_2O;
30 to 47% PbO;
3 to 24% $BaO + SrO + CaO + MgO + ZnO$;
0 to 20% BaO;
0 to 15% SrO;

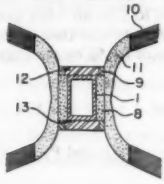
0 to 10% CaO;
0 to 8% MgO;
0 to 15% ZnO; and
1 to 7% ZrO_2;
wherein the weight ratio of alkali metal oxides/PbO ranges from 0.1 to 0.3.

4,562,163

BORON NITRIDE COMPLEX AND PROCESS FOR ITS PREPARATION, AND PROCESS FOR PREPARING A LIGHT-TRANSMITTING DENSE BODY OF CUBIC SYSTEM BORON NITRIDE

Tadashi Endo; Tadao Sato, and Osamu Fukunaga, all of Sakura, Japan, assignors to National Institute for Researches in Inorganic Materials, Ibaraki, Japan

Filed Sep. 14, 1983, Ser. No. 532,093
Claims priority, application Japan, Sep. 27, 1982, 57-168082; Sep. 27, 1982, 57-168083
Int. Cl.⁴ C04B *35/58;* **C01B** *21/064*
U.S. Cl. 501—96 **4 Claims**



3. A process for producing a boron nitride complex, which comprises:
(a) placing hBN powder or a sintered product thereof in a crucible;
(b) placing lithium, an alkaline earth metal, lithium nitride or boride or an alkaline earth metal nitride or boride outside of said crucible; and
(c) heating the materials of steps (a) and (b) in a non-oxidizing atmosphere, thereby causing the metal, nitride or boride of step (b) to deposit on and diffuse into the hBN powder or sintered product thereof in the form of its boron nitride.

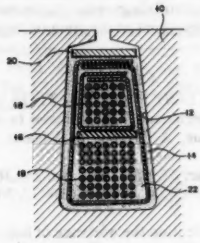
4,562,164

INSULATION OF A COIL USED IN ELECTRICAL APPARATUS

Haruo Miyazaki; Yasuaki Yamasaki, and Tsutomu Oshiyama, all of Kitakyushu, Japan, assignors to Nikkiso Co. Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 512,908, Jul. 11, 1983, abandoned, which is a continuation-in-part of Ser. No. 270,392, Jun. 4, 1981, abandoned. This application Jan. 23, 1985, Ser. No. 693,767
Int. Cl.⁴ C04B *33/32, 35/00;* **H01B** *3/02;* **H02K** *3/30*
U.S. Cl. 501—151 **5 Claims**

1. A ceramic-like insulating material for insulating the windings of a coil, said ceramic-like insulating material being the reaction product of an impregnant comprising a suspension of a silicone resin and a synthetic fluoro-mica in an organic solvent, said reaction product being derived on subjecting the impregnant, after curing, to temperatures above about 300° C. to thermally decompose the silicone resin, evidenced by loss of organic radicals from the silicone resin, with resulting conversion of the resin to polysiloxane which is exposed to a fluoro-compound vaporized from said synthetic fluoro-mica at the same temperature as that at which decomposition of the silicone resin occurs.

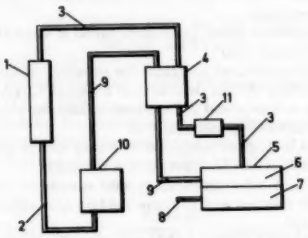


4,562,165

REGENERATING SORBENTS

James Wilson, and David J. A. McCaffrey, both of Cheltenham, England, assignors to Coal Industry (Patents) Ltd., London, England

Filed Jan. 24, 1984, Ser. No. 573,316
Claims priority, application United Kingdom, Feb. 25, 1983, 8305320
Int. Cl.⁴ B01J *20/34*
U.S. Cl. 502—33 **11 Claims**



1. A method for the regeneration of sorbents saturated or partially saturated with water, wherein a column containing a bed of the sorbent has passed therethrough an organic liquid carrier solvent at a first temperature in the range 60° C. to the boiling point of the carrier solvent, at which first temperature water has an appreciable solubility in the carrier solvent, such that at least a portion of the water trapped in the sorbent will be dissolved in the carrier solvent, cooling the resulting solution to a second temperature in the range 0° C. to 40° C., at which second temperature water has a low solubility in the carrier solvent, and allowing the resulting solution to separate out into a substantially pure water phase and a substantially pure carrier solvent phase.

4,562,166

SYNTHESIS OF DODECASIL-1H WITH A METHYLAZABICYCLONONANIUM DIRECTING AGENT

Ernest W. Valyocsik, Yardley, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 19, 1984, Ser. No. 673,056
Int. Cl.⁴ C01B *33/28;* **B01J** *29/28*
U.S. Cl. 502—62 **15 Claims**

1. A method for preparing a Dodecasil-1H zeolite which comprises preparing a mixture capable of forming said zeolite, said mixture comprising sources of alkali or alkaline earth

metal ions, an oxide of aluminum, an oxide of silicon, a methylazabicyclononanium cation and water, said mixture having a composition, in terms of moles of ions or oxides, falling within the following ranges:

SiO_2/Al_2O_3=200–infinity
H_2O/SiO_2=5–200
OH^-/SiO_2=0–0.80
M/SiO_2=0.01–2.0
R/SiO_2=0.01–2.0

wherein R is the methylazabicyclononanium cation, and M is the alkali or alkaline earth metal ion, said method further comprising maintaining said mixture under sufficient conditions until said zeolite is formed.

15. A synthetic crystalline zeolite Dodecasil-1H material in the as-synthesized form having a formula, in terms of moles of oxides, in the anhydrous state as follows:

$(0.01\text{-}5)R_2O:(0\text{-}3)M_{2/n}O:(0.4 \text{ or less})Al_2O_3:(100)SiO_2$

where R is a methylazabicyclononanium cation, M is an alkali or alkaline earth metal ion and n is the valence of M.

4,562,167

LIQUID TREATING AGENT FOR CRACKING CATALYST

Brent J. Bertus, and Dwight L. McKay, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 323,591, Nov. 20, 1981, Pat. No. 4,489,169, which is a division of Ser. No. 130,678, Mar. 17, 1980, Pat. No. 4,321,129, which is a division of Ser. No. 941,896, Sep. 12, 1978, Pat. No. 4,255,287, which is a continuation-in-part of Ser. No. 845,184, Oct. 25, 1977, abandoned. This application Apr. 9, 1984, Ser. No. 597,880
Int. Cl.[4] B01J *33/00*
U.S. Cl. 502—100 **16 Claims**

1. A liquid treating agent composition suitable for passivating contaminating metals on a cracking catalyst comprising a solution or dispersion of (A) antimony or at least one compound of antimony, and (b) tin or at least one compound of tin wherein the weight ratio of antimony to tin is in the range of 0.5/1 to 10/1.

4. A composition according to claim **1** wherein (A) comprises an organic antimony compound, and (B) comprises an organic tin compound.

5. A composition according to claim **4** wherein (A) comprises an antimony thiophosphate.

9. A composition according to claim **5** wherein (B) comprises a dihydrocarbyltin oxide.

4,562,168

CATALYST AND OLEFIN POLYMERIZATION

Clifford C. Lee, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 17, 1984, Ser. No. 611,263
Int. Cl.[4] C08F *4/64*
U.S. Cl. 502—107 **22 Claims**

1. A process for making a catalyst comprising

(1) reacting a metal halide selected from the group consisting of magnesium dihalides and magnesium hydroxyhalides and a transition metal compound wherein the transition metal is titanium bonded to at least one radical selected from the group consisting of hydrocarbyl oxides, imides, amides, and mercaptides to form a first catalyst component,

(2) mixing a solution of said first catalyst component with a second catalyst component comprising an organoaluminum compound at a temperature in the range of about −100° C. to about 70° C. to form a precipitate,

(3) subjecting precipitate from step (2) in the presence of at least a portion of the supernatant liquid remaining after step (2) to a temperature higher than that used in step (2) and of at least 50° C. for a length of time sufficient to result in the formation of some additional amount of precipitate, and

(4) reacting solid precipitate resulting from step (3) with a halogen ion exchanging agent.

4,562,169

ALPHA-OLEFINS POLYMERIZATION CATALYST OF HIGH PRODUCTIVITY

Robert O. Hagerty, Edison; Irena B. Petsche, Cranbury, and Kenneth G. Schurzky, Bridgewater, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 4, 1984, Ser. No. 657,642
Int. Cl.[4] C08F *4/64*
U.S. Cl. 502—107 **40 Claims**

1. In a process for preparing a catalyst composition for use in alpha-olefin polymerization reactions comprising the steps of:

(i) heating a solid, porous carrier having reactive OH groups;

(ii) contacting the solid, porous carrier with a first liquid, said first liquid containing at least one organomagnesium composition having the empirical formula

$$R_nMgR'_{(2-n)} \quad (I)$$

where R and R′ are the same or different and they are C_1–C_{12} hydrocarbyl groups, provided that R′ may also be halogen, and n is 0, 1 or 2, the number of moles of said organomagnesium composition being in excess of the number of moles of said OH groups on said carrier;

(iii) removing said first liquid from step (i) to obtain a magnesium-containing carrier in the form of a dry, free-flowing powder; and,

(iv) contacting said powder of step (ii) with a solution comprising a second liquid and at least one transition metal compound, said transition metal compound being soluble in said second liquid, and said magnesium of said carrier being substantially insoluble in said second liquid, whereby a compound of transition metal, which is insoluble in said liquid medium becomes incorporated onto said carrier, thereby forming a catalyst precursor; an improvement comprising heating the solid porous carrier in step (i) in the atmosphere of an oxygen-containing gas.

4,562,170

POLYMERIZATION CATALYST

Victoria Graves, Crosby, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Sep. 4, 1984, Ser. No. 647,322
Int. Cl.[4] C08F *4/64*
U.S. Cl. 502—113 **20 Claims**

1. A supported olefin polymerization catalyst prepared under anhydrous conditions by the steps of:

(1) sequentially

(a) preparing a slurry of inert particulate support material,

(b) adding to said slurry a solution of an organomagnesium compound,

(c) adding to said slurry and reacting a solution of hafnium compound, and

(2) thereafter

(d) adding to said slurry and reacting a halogenator,

(e) adding to said lsurry and reacting a tetravalent titanium compound and

(f) recovering solid catalyst.

4,562,171

METHOD OF PREPARING HIGH CIS-1,4 DIENE POLYMERS HAVING GOOD GREEN STRENGTH AND TACK USING A CATALYST COMPOSITION CONTAINING A CARBOXYLATED METAL OXY ALUMINATE COMPONENT

Jung W. Kang, Clinton, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 616,766, Jun. 4, 1984, Pat. No. 4,522,989. This application Mar. 4, 1985, Ser. No. 707,980

Int. Cl.⁴ C08F *4/70*

U.S. Cl. 502—117 **11 Claims**

1. A catalyst composition comprising:

(a) a carboxylated metal oxy aluminate compound selected from the group consisting of compounds represented by the formulae $(RCOOMO-)_2AL$ and $(RCOOMO-)_2ALOR'$, wherein R and R' are alkyl radicals containing from 7 to 17 carbon atoms, and M is nickel or cobalt;

(b) an organometallic compound in which the metal is selected from Groups I, II, and III of the Periodic System; and

(c) one or more fluorine containing compounds selected from the group consisting of boron trifluoride complexes with ethers, alcohols or mixtures thereof; hydrogen fluoride; hydrogen fluoride complexes with ethers, alcohols or mixtures thereof and mixtures of said compounds.

4,562,172

METHOD OF PREPARING HIGH CIS-1,4 DIENE POLYMERS HAVING GOOD GREEN STRENGTH AND TACK

Jung W. Kang, Clinton, and James E. Hall, Akron, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 616,767, Jun. 4, 1984, Pat. No. 4,522,988. This application Mar. 4, 1985, Ser. No. 707,981

Int. Cl.⁴ C08F *4/70*

U.S. Cl. 502—117 **11 Claims**

1. A catalyst composition comprising:

(a) a carboxylated metal oxy borate compound selected from the group consisting of compounds represented by the formulae $(RCOOMO-)_2B$ and $(RCOOMO-)_2BOR'$, wherein R and R' are alkyl radicals containing from 7 to 17 carbon atoms, and M is nickel or cobalt;

(b) an organometallic compound in which the metal is selected from Groups I, II, and III of the Periodic System; and

(c) one or more fluorine containing compounds selected from the group consisting of boron trifluoride complexes with ethers, hydrogen fluoride complexes with ethers, alcohols or mixtures thereof and mixtures of said compounds.

4,562,173

CATALYST COMPONENT FOR THE POLYMERIZATION OF OLEFINS AND CATALYST THEREFOR

Minoru Terano, Chigasaki; Kouhei Kimura, Kanagawa; Atsushi Murai, Chigasaki; Masuo Inoue, Chigasaki, and Katsuyoshi Miyoshi, Chigasaki, all of Japan, assignors to Toho Titanium Co., Ltd., Tokyo, Japan

Filed Nov. 28, 1984, Ser. No. 675,557

Claims priority, application Japan, Aug. 24, 1984, 59-175230

Int. Cl.⁴ C08F *4/64*

U.S. Cl. 502—127 **20 Claims**

1. A catalyst component (A) for the polymerization of olefins obtained by a process comprising contacting (a) a fatty acid salt of magnesium and (b) a carbonate of magnesium or a substance containing said carbonate, (c) diester of an aromatic dicarboxylic acid, and (d) a titanium halide of the general formula: TiX_4, wherein X represents a halogen atom (hereinafter may be referred to as a titanium halide), said catalyst component being used in combination with (B) a silicon compound represented by the general formula: $SiR_m(OR')_{4-m}$, wherein R is hydrogen, alkyl group, or aryl group, R' is alkyl group or aryl group, and m is represented as $0 \leqq m \leqq 4$ (hereinafter may be referred to as a silicon compound), and with (C) an organoaluminium compound.

4,562,174

CATALYST FOR THE PRODUCTION OF ALKANOLS

Alvin B. Stiles, Wilmington, Del., assignor to Alberta Gas Chemicals Ltd., Edmonton, Canada

Filed May 21, 1984, Ser. No. 612,633

Int. Cl.⁴ B01J *23/72, 23/78, 23/80, 23/84*

U.S. Cl. 502—174 **25 Claims**

1. A catalyst composition for use in the production of alkanols containing from 1 to 6 carbon atoms from a feed gas comprised of hydrogen and carbon monoxide, which is comprised of:

(i) a mixture of the oxides of copper, zinc, and cobalt, which mixture may optionally contain manganese oxide;

(ii) a stabilizer selected from the group consisting of aluminum oxide, cerium oxide, other lanthanides, zirconium oxide, titanium oxide, silicon dioxide, niobium oxide, tantalum oxide, chromic oxide, an alkaline earth metal oxide, an alkaline earth metal carbonate, and mixtures thereof; and

(iii) at least one alkali metal salt or hydroxide, with the proviso that at least one of said salt or hydroxide be of rubidium or cesium.

4,562,175

SYNTHETIC PEPTIDES

Ding Chang, Peninsula Laboratories, Inc., 611 Taylor Way, Belmont, Calif. 94002; Akira Arimura; Michael D. Culler, both of Laboratories for Molecular Neuroendocrinology and Diabetes (LMNED) Bunker 15, Tulane University'S Herbert Research Center, Belle Chassee, La. 70037, and Jaw-Kang Chang, Peninsula Laboratories, Inc., 611 Taylor Way, Belmont, Calif. 94002

Filed Feb. 3, 1984, Ser. No. 576,712

Int. Cl.⁴ C07C *103/52;* A61K *37/02*

U.S. Cl. 514—12 **4 Claims**

1. A synthetic peptide growth hormone releasing factor having the following amino acid sequence:

Thr—Ala—Asp—Ala—Ile—Phe—Thr—Asn—Ser—
1 5
—Tyr—Arg—Lys—Val—Leu—Gly—Gln—Leu—Ser—
10 15
—Ala—Arg—Lys—Leu—Leu—Gln—Asp—Ile—Nle—
20 25
—Ser—Arg—Gln—Gln—Gly—Glu—Ser—Asn—Gln—
30 35
—Glu—Arg—Gly—Ala—Arg—Ala—Arg—Leu—NH_2.
40 44

4,562,176

METHOD AND COMPOSITION FOR TREATING CANCER

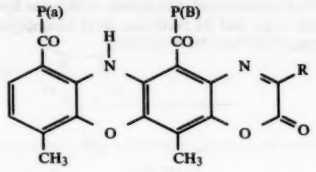
Sisir K. Sengupta, 978 Webster St., Needham, Mass. 02192

Filed Oct. 3, 1985, Ser. No. 538,240

Int. Cl.⁴ A61K *37/00;* C07C *103/52*

U.S. Cl. 514—17 **4 Claims**

1. A composition of matter active as a toxic agent against cancer cells sensitive to actinomycin D, said composition having the formula:



wherein R is selected from the group consisting of C_6H_4Cl (o), C_6H_4Cl (m), C_6H_4Cl (p), $C_6H_3Cl_2$ (2,4) and C_6F_5 (pentaflurophenyl), and P is pentapeptidolactone.

4,562,177

3'-AMINO-2' HALO-ANTHRACYCLINE ANTIBIOTICS

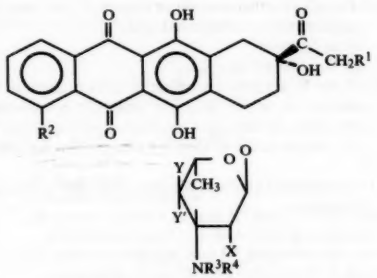
Derek Horton, and Waldemar A. Priebe, both of Columbus, Ohio, assignors to The Ohio State University Research Foundation, Columbus, Ohio

Continuation-in-part of Ser. No. 408,942, Aug. 19, 1982, Pat. No. 4,427,664, which is a continuation of Ser. No. 268,623, May 29, 1981, abandoned. This application Apr. 22, 1983, Ser. No. 487,841

Int. Cl.[4] A61K *31/71;* **C07H** *15/24*

U.S. Cl. 514—34 **19 Claims**

17. A method for treating murine P388 or L1210 leukemia in a test animal, which method comprises administering to said test animal a therapeutically-effective amount of a compound of the formula



wherein R^1 is a hydrogen atom or a hydroxyl group; R^2 is a hydrogen atom or a hydroxyl or methoxyl group; X is a fluorine, chlorine, bromine or iodine atom; one of Y and Y' is a hydrogen atom and the other is a hydrogen atom or a hydroxyl or acetoxyl group; R^3 and R^4 are each independently a hydrogen atom, an alkyl group containing not more than about four carbon atoms, or an acetoxyl, trifluoroacetoxyl or benzyl group. or R^3 and R^4 together form a polymethylene chain having from 2 to 6 carbon atoms; or a pharmaceutically-acceptable acid addition salt thereof.

4,562,178

USE OF DIETHYLAMINOETHYLDEXTRAN (DEAE-D) AS AN ANTIHYPERINSULINEMIC DRUG

Filippo Vita, Rome, Italy, assignor to Medosan Industrie Biochimiche Riunite S.p.A., Albano Laziale, Italy

Filed Dec. 19, 1984, Ser. No. 683,676

Claims priority, application Italy, Dec. 23, 1983, 49659 A/83

Int. Cl.[4] A61K *31/70*

U.S. Cl. 514—59 **4 Claims**

1. A method for decreasing hyperinsulinemia in humans comprising administering orally to a hyperinsulinemic subject an amount of diethylaminoethyldextran pharmaceutically effective to decrease the level of insulin in the blood.

4,562,179

PHOSPHOLIPID DERIVATIVES, AND PHARMACEUTICAL COMPOSITION OF THE SAME

Tsutomu Teraji, Osaka; Eishiro Todo; Norihiko Shimazaki, both of Toyonaka; Teruo Oku, Osaka, and Takayuki Namiki, Minoo, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

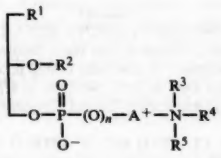
Filed Apr. 6, 1983, Ser. No. 482,447

Claims priority, application United Kingdom, Apr. 19, 1982, 8211284

Int. Cl.[4] A61K *31/685;* **C07F** *9/9*

U.S. Cl. 514—77 **8 Claims**

1. A compound of the formula:



wherein

R^1 is higher alkyl or higher alkoxy;

R^2 is lower alkyl;

R^3, R^4 and R^5 are each lower alkyl;

n is 0 or 1; and

A is lower alkylene optionally interrupted by a —NHCO— group;

provided that n is 0, or A is lower alkylene interrupted by a —NHCO— group, when R^1 is higher alkoxy;

or a pharmaceutically acceptable salt thereof.

2. A method for treating fibrosarcoma Meth A which comprises administering an effective amount of the compound of claim **1** to a subject in need of said treatment.

4,562,180

PESTICIDAL O-(N-ALKOXY-SUBSTITUTED-ORTHO-FLUORO-BENZIMIDOYL)-THIOPHOSPHONATES

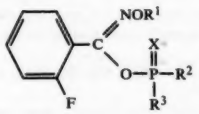
William F. King, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 30, 1984, Ser. No. 595,098

Int. Cl.[4] A01N *57/14;* **C07F** *9/40*

U.S. Cl. 514—114 **21 Claims**

1. A compound of the formula



wherein X is sulfur or oxygen/ R^1 is lower alkyl having from 1 to 3 carbon atoms; R^2 is lower alkyl having from 1 to 4 carbon atoms; and R^3 is lower alkylthio having from 1 to 4 carbon atoms.

12. A method of killing insects which comprises contacting said insect or its environment with an insecticidally effective amount of a compound of claim **1**.

4,562,181

AMORPHOUS FORM OF CEFUROXIME ESTER

Harold A. Crisp, Harrow Weald, and John C. Clayton, Pinner, both of England, assignors to Glaxo Group Limited, London, England

Filed Jul. 29, 1983, Ser. No. 518,693

Claims priority, application United Kingdom, Jul. 30, 1982, 8222019

Int. Cl.⁴ A61K *31/545*; C07D *501/24*

U.S. Cl. 514—202 **14 Claims**

1. Cefuroxime axetil in amorphous form essentially free from crystalline material, and having a purity of at least 95% aside from residual solvents.

4,562,182

COMPOUNDS CONTAINING BETA-LACTAMS

John B. Harbridge, Coulsdon, and Irene Stirling, Reigate, both of England, assignors to Beecham Group p.l.c., England

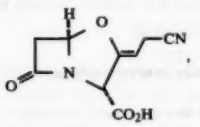
Filed Dec. 8, 1981, Ser. No. 328,736

Claims priority, application United Kingdom, Dec. 23, 1980, 8041274

Int. Cl.⁴ C07D *487/04*; A61K *31/42*

U.S. Cl. 514—210 **14 Claims**

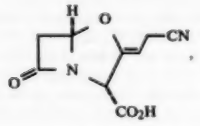
1. A compound of the formula (I):



(I)

a salt thereof or a pharmaceutically acceptable ester thereof.

7. A pharmaceutical composition useful for treating bacterial infections in humans and animals and for effecting β-lactamase inhibition in humans and animals which comprises an antibacterially effective amount or a β-lactamase inhibitory amount of a compound of the formula (I):



(I)

a pharmaceutically acceptable salt thereof or a pharmaceutically acceptable ester thereof, in combination with a pharmaceutically acceptable carrier.

4,562,183

PERFLUORO-1-AZABICYCLO(5,3,0)DECANE COMPOUNDS USEFUL AS BLOOD SUBSTITUTES

John C. Tatlow; Raymond G. Plevey, both of Birmingham; David E. M. Wotton, Bristol, and Colin R. Sargent, Clevedon, all of England, assignors to I.S.C. Chemicals Limited, London, England

Filed Jan. 24, 1983, Ser. No. 460,393

Claims priority, application United Kingdom, Jan. 22, 1982, 8201821

Int. Cl.⁴ C07D *499/00*; A61K *31/40*

U.S. Cl. 514—214 **4 Claims**

1. A perfluoroazabicyclodecane compound having a bridgehead nitrogen in its structure wherein said compound is selected from the group consisting of perfluoro-1-azabicyclo(5,3,0)decane, which has fused 5- and 7-membered rings, and its perfluoroalkyl homologues of 1–2 carbon atoms.

3. An oil-in-water emulsion useful as a blood substitute comprising a perfluoroazabicyclodecane compound having a bridgehead nitrogen in its structure when said compound is dispersed in an aqueous phase by a surface active agent wherein said compound is selected from the group consisting of perfluoro-1-azabicyclo(5,3,0)decane, which has fused 5- and 7-membered rings, and its perfluoro alkyl homologues of 1–2 carbon atoms.

4,562,184

SUBSTITUTED-AMINOHYDROXYPROPOXY-THIADIAZOLES, β-BLOCKING COMPOSITIONS AND USE

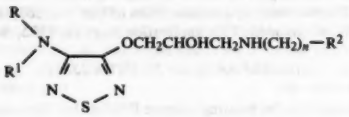
John J. Baldwin, Gwynedd Valley, and Gerald S. Ponticello, Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 2, 1984, Ser. No. 596,185

Int. Cl.⁴ A61K *31/425, 31/535*; C07D *285/10, 413/04*

U.S. Cl. 514—222 **9 Claims**

1. A compound of structural formula:



or a pharmaceutically acceptable salt thereof wherein:

n is 1, 2 or 3;

R and R^1 are independently

(1) C_{1-8} alkyl, either straight or branched chain and either unsubstituted or substituted with:

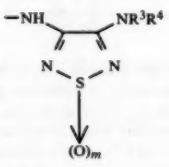
(a) hydroxy or

(b) C_{1-4} alkoxy; or

(2) R and R^1 are joined together directly to form, with the nitrogen to which they are attached, pyrrolidino or piperidino, or through a heteroatom selected from O, N (C_{1-3} alkyl) and S to form a six-membered heterocyle;

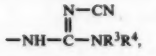
R^2 is

(1) 6-membered heterocyclic aryl, with one or two nitrogen atoms,



(2)

wherein m is 1 or 2, or



(3)

wherein R^3 and R^4 are independently,

(a) hydrogen,

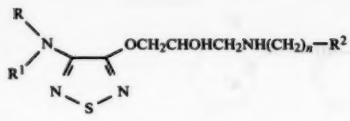
(b) C_{1-14} alkyl,

(c) carbocyclic aryl, or

(d) joined together, R^3 and R^4 form a 5-membered ring with the nitrogen to which they are attached, or

(e) joined together R^3 and R^4, either directly or through a second heteroatom selected from O, S, and N-(C_{1-4} alkyl), form a 6-membered heterocycle.

4. A pharmaceutical β-blocking formulation comprising a pharmaceutically acceptable carrier and an effective β-blocking amount of a compound of structural formula;



or a pharmaceutically acceptable salt thereof wherein:

n is 1, 2 or 3;

R and R^1 are independently

(1) C_{1-8} alkyl, either straight or branched chain and either unsubstituted or substituted with:

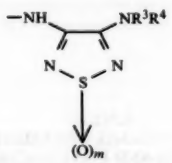
(a) hydroxy or

(b) C_{1-4} alkoxy; or

(2) R and R^1 are joined together directly to form, with the nitrogen to which they are attached, pyrrolidino or piperidino, or through a heteroatom selected from O, N (C_{1-3} alkyl) and S to form a six-membered heterocyle;

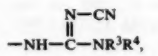
R^2 is

(1) 6-membered heterocyclic aryl, with one or two nitrogen atoms,



(2)

wherein m is 1 or 2, or



(3)

wherein R^3 and R^4 are independently,

(a) hydrogen,

(b) C_{1-4} alkyl,

(c) carbocyclic aryl, or

(d) joined together R^3 and R^4 form a 5-membered ring with the nitrogen to which they are attached, or

(e) joined together R^3 and R^4, either directly or through a second heteroatom selected from O, S, and N (C_{1-4} alkyl), form a 6-membered heterocycle.

4,562,185

FIVE-MEMBERED NITROGEN-CONTAINING HETERO-CYCLIC COMPOUNDS AND THEIR USE AS PEST-COMBATING AGENTS

Gerhard Jäger, Leverkusen; Rudolf Fauss, Cologne; Kurt Findeisen, Odenthal; Benedikt Becker, Mettmann, and Bernhard Homeyer, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

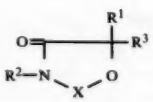
Filed Mar. 15, 1984, Ser. No. 589,985

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1983, 3311636

Int. Cl.[4] A01N *43/82*; C07D *291/04*

U.S. Cl. 514—229 **6 Claims**

1. A five-membered nitrogen-containing heterocyclic compound of the formula



in which

X is S, SO or SO_2,

R^1 represents phenyl which can be optionally independently substituted by one or more of halogen, nitro, amino, OH, CN, C_{1-4}-alkyl, C_{1-4}-halogenoalkyl, C_{1-4}-alkoxy, methylenedioxy, ethylenedioxy, C_{1-4}-halogenoalkoxy, difluoromethylenedioxy or halogen-substituted ethylenedioxy, C_{1-4}-alkylthio, C_{1-4}-halogenoalkylthio, C_{2-8}-alkylsulphonyl, C_{1-4}-halogenoalkylsulphonyl, carboxyl, carbalkoxy, the radical C_{1-4}—alkoxy—N=CH—, or phenyl, phenoxy, phenylthio which can be optionally substituted by halogen or C_{1-4}-alkyl, or represents carboxyalkoxy having 2–4 C atoms, or

R^1 furthermore represents pyridinyl, pyrimidinyl, triazinyl, isoxazolyl, thiazolyl, oxadiazolyl, imidazolyl, triazolyl, furanyl or thienyl, which can be optionally mono- or polysubstituted by identical or different substituents from amongst halogen, C_{1-4}-alkyl, and C_{1-4}-alkoxy,

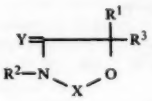
R^2 represents hydrogen, one equivalent of an alkali metal cation, alkaine earth metal cation or optionally substituted ammonium cation, C_{1-6}-alkyl, halogeno-C_{1-6}-alkyl, C_{2-4}-alkenyl or C_{2-4}-alkinyl,

R^3 is C_{1-7}-alkyl optionally substituted by one or more of halogen, C_{1-4}-alkoxy, carboxyl, carbalkoxy, or phenyl, phenoxy or phenylthio, it being possible for the phenyl rings to be substituted by halogen or alkyl, or is —CO—R^4,

R^4 is amino, alkylamino, arylamino, aralkylamino, dialkylamino, cycloalkylamino, alkenylamino, trialkylsilylamino, trialkylsilylalkylamino, nitrogen-containing saturated heterocyclic radicals which optionally contain further heteroatoms, or is —NHR^7, and

R^7 is hydroxyl, formyl, alkylcarbonyl, alkenylcarbonyl, cycloalkenylcarbonyl or arylcarbonyl.

6. A method of combatting insects and acarids which comprises administering to such insects and acarids or to a habitat thereof an insecticidally and acaricidally effective amount of a five-membered nitrogen-containing heterocyclic compound of the formula



in which

R^1 represents C_{1-7}-alkyl, C_{2-7}-alkenyl, C_{3-7}-cycloalkyl or C_{5-8}-cycloalkenyl, which can be optionally independently substituted by one or more of halogen, C_{1-4}-alkoxy, carboxyl, carbalkoxy, or phenyl, phenoxy or phenylthio, it being possible for the phenyl rings to be substituted by halogen or alkyl; or

R^1 furthermore represents phenyl which can be optionally independently substituted by one or more of halogen, nitro, amino, OH, CN, C_{1-4}-alkyl, C_{1-4}-halogenoalkyl, C_{1-4}-alkoxy, methylenedioxy, ethylenedioxy, C_{1-4}-halogenoalkoxy, difluoromethylenedioxy or halogen-substituted ethylenedioxy, C_{1-4}-alkylthio, C_{1-4}-halogenoalkylthio, C_{2-8}-alkylsulphonyl, C_{1-4}-halogenoalkylsulphonyl, carboxyl, carboxyl, the radical C_{1-4}-alkoxy—N=CH—, or phenyl, phenoxy, Phenylthio which can be optionally substituted by halogen or C_{1-4}-alkyl, or represents carboxyalkoxy having 2–4 C atoms, or

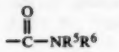
R^1 furthermore represents pyridinyl, pyrimidinyl, triazinyl, isoxazolyl, thiazolyl, oxadiazolyl, imidazolyl, triazolyl, furanyl or thienyl, which can be optionally mono- or polysubstituted by identical or different substituents from amongst halogen, C_{1-4}-alkyl, and C_{1-4}-alkoxy,

R^2 represents hydrogen, one equivalent of an alkali metal cation, alkaline earth metal cation or optionally substituted ammonium cation, trialkylsilyl having 1–4 C atoms in the alkyl part, C_{1-4}-alkyl, C_{1-4}-alkylcarbonyl, phenyl or

benzoyl, which can be optionally substituted by one or more of the following radicals (A), the substituents being identical or different:

(A) represents halogen, nitro, amino, CN, C_{1-4}-alkyl, C_{1-4}-halogenoalkyl, C_{1-4}-alkoxy, C_{1-4}-halogenoalkoxy, methylenedioxy, ethylenedioxy or difluoromethylenedioxy, halogen-substituted ethylenedioxy, C_{1-4}-alkylthio, C_{1-4}-halogenoalkylthio, C_{2-8}-alkoxyalkyl, C_{2-8}-halogenoalkoxyalkyl, C_{1-5}-alkylsulphenyl or phenylsulphenyl, C_{1-4}-alkylsulphonyl, C_{1-4}-halogenoalkylsulphonyl, carbalkoxy, the radical C_{1-4}-alkoxy—N=CH—, or phenyl, phenoxy or thiophenyl, which can be optionally substituted by halogen or by C_{1-4}-alkyl, or represents carboxyalkoxy having 2–4 C atoms, or

R^2 furthermore represents C_{1-4}-alkoxycarbonyl, phenoxycarbonyl which can be optionally substituted by one or more of the radicals (A), C_{1-4}-alkylsulphonyl, phenylsulphonyl which can be optionally substituted by one or more of the radicals (A), C_{1-4}-alkylaminosulphonyl, C_{1-5}-alkylsulphenyl or phenylsulphenyl, di-C_{1-4}-alkylaminosulphonyl, phenylaminosulphonyl which can be optionally substituted by one or more of the radicals (A), phenyl-C_{1-4}-alkylaminosulphonyl or a radical of the formula



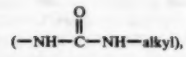
wherein

R^5 and R^6 independently of one another represent hydrogen, C_{1-20}-alkyl, C_{3-6}-cycloalkyl, phenyl which can be optionally substituted by one or more of the radicals (A), phenylcarbonyl which can be optionally substituted by one or more of the radicals (A), C_{1-10}-alkylcarbonyl, C_{1-4}-alkylaminocarbonyl, C_{1-10}-alkoxycarbonyl, phenylaminocarbonyl or phenylsulphonyl, which can be optionally substituted by one or more of the radicals (A),

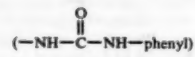
R^3 represents the radicals stated for R^1, or also CN or the radical COR^4, R^4 represents amino, C_{1-8}-alkylamino or di-C_{1-8}-alkylamino, which can be optionally substituted by hydroxyl or C_{1-4}-alkoxy, phenylamino which can be optionally substituted by one or more of the radicals (A) given above, C_{5-6}-cycloalkylamino, a saturated heterocyclic structure having 5–6 C atoms in the ring, or a radical of the formula

wherein

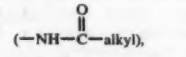
R^7 represents C_{1-4}-alkyl-carbonyl, C_{2-4}-alkenylcarbonyl, C_{5-8}-cycloalkenylcarbonyl, C_{1-4}-alkylamino, phenylamino which can be optionally substituted by one or more of the radicals (A) given above, C_{1-4}-alkylaminocarbonylamino



phenylaminocarbonylamino

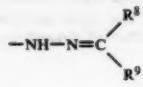


which can be optionally substituted by one or more of the radicals (A), C_{1-4}-alkylcarbonylamino



or benzoylamino which can be optionally substituted by one or more of the radicals (A); or

R^4 furthermore represents a radical of the formula



wherein

R^8 represents C_{1-4}-alkyl, or phenyl which can be optionally substituted by one or more of the radicals (A),

R^9 represents hydrogen or C_{1-4}-alkyl,

Y represents O and

X represents SSO and SO_2,

wherein

R^{10} and R^{11} represent C_{1-4}-alkyl.

4,562,186

(1,2,4-OXADIAZOL-3-YL)ARYLMETHANONES, COMPOSITIONS AND PHARMACEUTICAL USE

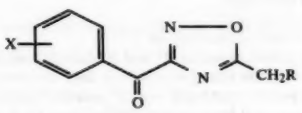
John J. Tegeler, Bridgewater, N.J. and Craig J. Diamond, North Wales, Pa., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Jan. 22, 1985, Ser. No. 693,509

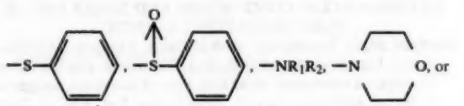
Int. Cl.[4] **A61K** *31/42, 31/535;* **C07D** *271/06, 413/06*

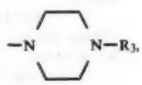
U.S. Cl. 514—238 **85 Claims**

1. A compound having the formula

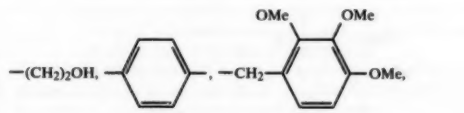


where X is independently hydrogen, halogen (F, Cl, Br or I), loweralkyl or loweralkoxy; and R is —CN, —$CONH_2$, —$COOCH(CH_3)_2$, —COOH, —$COO(CH_2)_4Cl$,





R_1 and R_2 being independently hydrogen or loweralkyl and R_3 being



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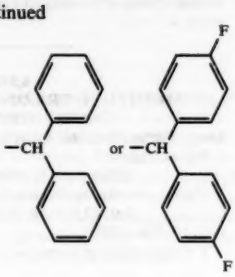
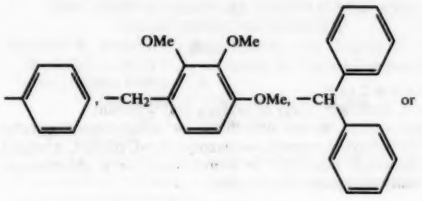
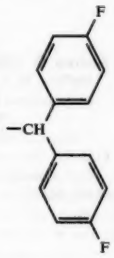






an optical antipode thereof, or a pharmaceutically acceptable acid addition salt thereof.

83. A method of treating a patient in need of depressing blood pressure which comprises administering to the patient an effective blood pressure depressing amount of a compound defined in claim **1**.

84. A method of treating a patient in need of alleviating pain which comprises administering to the patient an effective pain alleviating amount of a compound defined in claim **1**.

4,562,187

(ISOXAZOL-3-YL)ARYLMETHANONES, COMPOSITIONS AND PHARMACEUTICAL USE

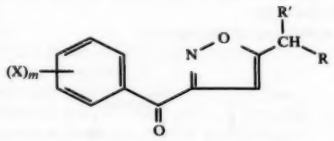
John J. Tegeler, Bridgewater, N.J. and Craig J. Diamond, North Wales, Pa., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Jan. 22, 1985, Ser. No. 693,508

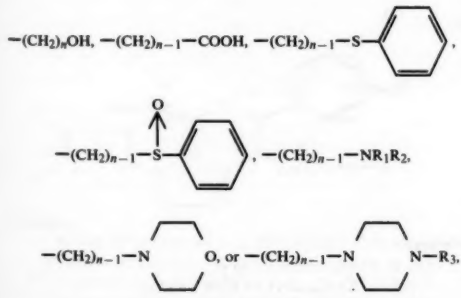
Int. Cl.[4] **A61K** *31/42, 31/535;* **C07D** *261/06, 413/06*

U.S. Cl. 514—238 **118 Claims**

1. A compound having the formula



where each X is independently hydrogen, halogen, loweralkyl or loweralkoxy; m is 1 or 2; R′ is hydrogen or loweralkyl; and R is



n being 1, 2 or 3, each of R_1 and R_2 being independently hydrogen or loweralkyl and R_3 being $—(CH_2)_2OH$,

an optical antipode thereof, or a pharmaceutically acceptable acid addition salt thereof.

116. A method of treating a patient in need of depressing blood pressure which comprises administering to the patient an effective blood pressure depressing amount of a compound defined in claim **1**.

117. A method of treating a patient in need of alleviating pain which comprises administering to the patient an effective pain alleviating amount of a compound defined in claim **1**.

4,562,188

TRIAZINONES FOR TREATING IRRITABLE BOWEL SYNDROME

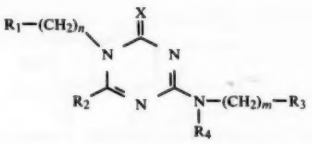
Donald E. Kuhla, Doylestown; William L. Studt, Harleysville; Henry F. Campbell, Lansdale, and John Yelnosky, Warrington, all of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Filed Jan. 13, 1984, Ser. No. 570,624

Int. Cl.[4] **C07D** *251/46, 251/52, 251/16;* **A61K** *31/53*

U.S. Cl. 514—245 **19 Claims**

1. A method which is effective in treating irritable bowel syndrome characterized by the contemporaneous symptoms of constipation, diarrhea and abdominal pain comprising the daily medication of a patient suffering from irritable bowel syndrome with an amount of a compound which is effective in relieving said symptoms and/or preventing the onset of said symptoms, wherein said compound is of the formula



wherein:

n and m are each independently 0, 1, 2 or 3;

X is oxygen or sulfur;

R_1 and R_3 are each independently hydrogen, alkyl, aryl, aralkyl, heterocyclyl, or heterocyclalkyl;

R_2 is NR_5 or SR_5;

R_4 is hydrogen, alkyl, lower alkanoyl, aryloxy, alkoxy, aminoalkyl, alkylaminoalkyl or dialkylaminoalkyl; or

R_3 and R_4 together with the nitrogen atom to which they are attached form a group of the formula

where a is 2 to 6;

R_5 is hydrogen, alkyl or aralkyl; and wherein:

heterocyclyl means substituted or unsubstituted pyridyl, pyrimidyl, pyrazolyl, imidazolyl, furyl, thienyl, oxazolyl, thiazolyl, piperidyl, or morpholinyl; or a pharmaceutically acceptable salt thereof.

4,562,189

PYRAZOLYLPIPERAZINES

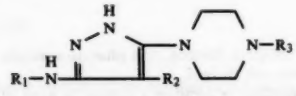
Andrew S. Tomcufcik, Old Tappan, N.J.; Walter E. Meyer, Suffern, N.Y., and Shin S. Tseng, Bridgewater, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Oct. 9, 1984, Ser. No. 659,116

Int. Cl.[4] A61K *31/415, 31/495;* **C07D** *295/00, 231/38*

U.S. Cl. 514—252 **19 Claims**

1. A compound selected from the group consisting of those of the formula:



wherein R_1 is hydrogen, alkyl(C_1–C_3)carbonyl or alkyl(C_1–C_3.)sulfonyl; R_2 is cyano or carbamoyl; and R_3 is methyl, benzyl, 3-phenylpropyl, 3-phenyl-2-propenyl, β-hydroxyethyl, 3-chlorobenzyl, 4-chlorobenzyl, 3,4-dichlorobenzyl, 2,6-dichlorobenzyl, 2-phenoxyethyl, 3-phenoxypropyl, 4-phenoxybutyl, 3-methoxybenzyl, 4-methoxybenzyl, 2-furanylmethyl, 2-pyridyl or (2-phenyl-2H-1,2,3-triazol-4-yl)methyl; and the pharmacologically acceptable acid-addition salts thereof.

18. The method of treating hypertension in a mammal which comprises administering to said mammal an effective antihypertensive amount of a compound of claim **1**.

4,562,190

BENZOTHIAZOLONE DERIVATIVES, PROCESSES FOR PREPARATION THEREOF AND PHARMACEUTICAL COMPOSITIONS COMPRISING THE SAME

Ikuo Ueda, Uenohigashi; Kiyoshi Taniguchi, Osaka, and Yousuke Katsura, Uenonishi, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

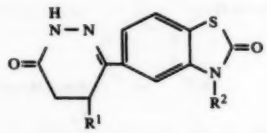
Filed Jul. 3, 1984, Ser. No. 627,612

Claims priority, application United Kingdom, Jul. 25, 1983, 8320005

Int. Cl.[4] C07D *417/02, 417/06, 417/10, 417/14*

U.S. Cl. 514—254 **8 Claims**

1. A compound of the formula:



wherein

R^1 is lower alkyl, and

R^2 is hydrogen, lower alkyl, carboxy(lower)alkyl, lower alkoxy(lower)alkyl, aliphatic acyl(lower)alkyl, aromatic acyl(lower)alkyl or heterocyclic acyl(lower)alkyl,

and pharmaceutically acceptable salts thereof.

7. A method for treatment of hypertension, heart disease and thrombosis in human beings and animals which comprises administering to the subject the pharmaceutical composition of claim **6**.

4,562,191

METHYL-PIPERAZINO DERIVATIVES WITH ANALGESIC ACTIVITY

Diego Furlan, Segrate, Italy, assignor to Euroresearch S.R.L., Milan, Italy

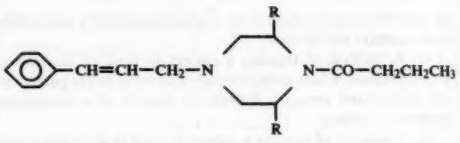
Filed Nov. 2, 1984, Ser. No. 667,714

Claims priority, application Italy, Nov. 15, 1983, 23720 A/83

Int. Cl.[4] A61K *31/495;* **C07D** *241/04*

U.S. Cl. 514—255 **2 Claims**

1. Compounds of formula:



where R is H or methyl, at least one R being methyl, and the corresponding salts obtained by salifying the basic compound with a therapeutically acceptable acid.

2. A therapeutic composition with both central and peripheral analgestic activity, consisting essentially of an analgesically effective amount of a compound according to claim **1** and a pharmaceutically acceptable carrier.

4,562,192

6-SUBSTITUTED-5-PHENYLTETRAZOLO[1,5-A][1,2,4]TRIAZOLE[1,5-C]PYRIMIDINES, AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

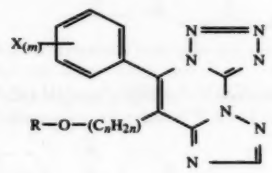
Hans Wagner, Skokie, Ill., assignor to G. D. Searle & Co., Skokie, Ill.

Filed Feb. 3, 1984, Ser. No. 576,700

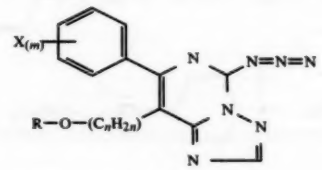
Int. Cl.[4] A61K *31/505;* **C07D** *487/04, 487/14*

U.S. Cl. 514—258 **15 Claims**

1. A compound of the formula



OR



wherein

n is an integer of from 1 to 6;

X is halo, C_1–C_4 alkyl, or C_1–C_4 alkoxy;

m is an integer of from 0 to 5;

R is hydrogen, C_1–C_8 alkyl, C_2–C_8 alkenyl, C_2–C_8 alkynyl, C_1–C_8 alkylsulfonyl or a

group, wherein R^1 is selected from the class consisting of C_1–C_8 alkyl C_2–C_8 hydroxycarbonylalkyl, C_1–C_8 alkylamino, C_3–C_{10} alkoxycarbonylalkylamino, adamantano, phenyl, substituted phenyl containing from 1 to 3 substituents selected from the class consisting of halo, C_1–C_4 alkyl and C_1–C_4 alkoxy.

15. A pharmaceutical composition comprising a therapeutically effective amount of a compound of claim 1 and one or more non-toxic pharmaceutically acceptable carriers.

4,562,193

4-[2-(DI- OR TRISUBSTITUTEDPHENOXY)ETHYL AMINO]THIENODIPYRIMIDINES AND INSECTICIDAL AND ACARICIDAL COMPOSITION CONTAINING SAID PYRIMIDINES

Shinjiro Yamamoto; Shinji Yokoi; Keigo Matsumoto, all of Shiga; Takeo Honda, and Takashi Kobayashi, both of Ube, all of Japan, assignors to Sankyo Company Limited, Tokyo and UBE Industries Ltd., Ube, both of, Japan

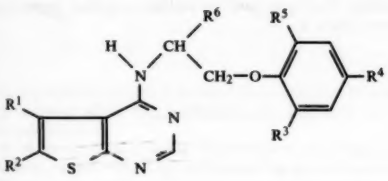
Filed Jul. 8, 1983, Ser. No. 512,144

Claims priority, application Japan, Jul. 21, 1982, 57-127225

Int. Cl.⁴ C07D *495/04;* A61K *31/505*

U.S. Cl. 514—358 **39 Claims**

1. Compounds of formula (I):



(I)

(wherein:

R^1, R^2 and R^6 are the same or different and each represents hydrogen or methyl;

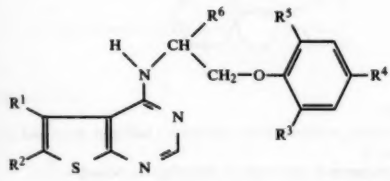
R^3 represents methyl or ethyl;

R^4 represents a C_1–C_7 alkyl group or ally; and

R^5 represents hydrogen, methyl or chlorine)

and acid addition salts thereof.

32. An insecticidal and acaricidal composition comprising an active compound in admixture with a carrier or diluent, wherein the active compound is selected from compounds of formula (I):



(I)

(wherein:

R^1, R^2 and R^6 are the same or different and each represents hydrogen or methyl;

R^3 represents methyl or ethyl;

R^4 represents a C_1–C_7 alkyl group or ally; and

R^5 represents hydrogen, methyl or chlorine) and acid addition salts thereof.

4,562,194

SYNERGISTIC NON-STEROIDAL ANTI-INFLAMMATORY COMPOUNDS AND COMPOSITIONS THEREOF

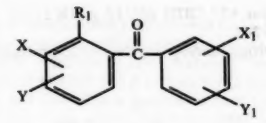
Richard V. Smerbeck, Hackettstown, and Eugene P. Pittz, Randolph, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jul. 31, 1984, Ser. No. 636,204

Int. Cl.⁴ A61K *31/12, 31/52*

U.S. Cl. 514—264 **17 Claims**

1. An anti-inflammatory composition for use in the treatment of mammals comprising at least one substituted benzophenone compound of the formula:



wherein R_1 is H or OH; X, Y, X_1 and Y_1 represent groups selected from hydrogen or halogen radicals, C_1–C_8 lower alkyl radicals, lower haloalkyl radicals, and C_1–C_8 lower alkoxy radicals, the salts thereof and combinations thereof; in combination with 3-isobutyl-1-methylxanthine; wherein said combination of compounds is present in a pharmaceutically acceptable carrier in amounts of about 0.05% to about 50% by weight of the total composition, and wherein the ratio of the benzophenone compound to the methyl xanthine compound is from about 0.016:1 to about 500:1.

4,562,195

REVERSING AMNESIA WITH SATURATED TRICYCLIC NITROGEN-CONTAINING DIONES

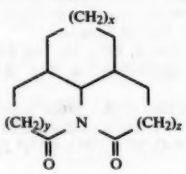
Donald E. Butler, Ann Arbor, and Yvon J. L'Italien, Plymouth, both of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 576,232, Feb. 2, 1984, abandoned. This application Jan. 7, 1985, Ser. No. 687,182

Int. Cl.⁴ A61K *31/47;* C07D *455/04*

U.S. Cl. 514—294 **22 Claims**

1. A compound having the structural formula I:



wherein x is zero; one, two, or three and y and z are independently zero or one.

4,562,196

2,4-DIAMINOPYRIDINE AS A PHARMACOLOGIC AGENT

Alan S. Horn, Noordhorn, and Sandor Agoston, Garrelsweer, both of Netherlands, assignors to Nelson Research & Development, Calif.

Filed Apr. 6, 1984, Ser. No. 597,732

Int. Cl.⁴ A61K *31/14, 31/44*

U.S. Cl. 514—332 **13 Claims**

1. A method for enhancing neuromuscular transmission, comprising the step of administering to a subject having im-

paired neuromuscular transmission an amount of 2,4-diaminopyridine or a pharmaceutically acceptable salt thereof sufficient to enhance neuromuscular transmission.

4,562,197

ANIMAL GROWTH PROMOTANT L-PYROGLUTAMYL-PYRIDYLALANYL-L-PROLINAMIDES

Michael Snarey, Eastry; Peter J. Swift, Wingham, Nr. Canterbury, and Michael J. Witty, Dover, all of England, assignors to Pfizer Inc., New York, N.Y.

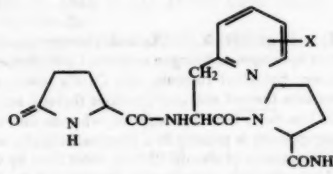
Filed Nov. 13, 1984, Ser. No. 670,780

Claims priority, application United Kingdom, Dec. 7, 1983, 8332704

Int. Cl.⁴ C07D *401/14;* A61K *31/44*

U.S. Cl. 514—343 **8 Claims**

1. A L-Pyroglutamyl-pyridylalanyl-L-prolinamide of the formula:



or a pharmaceutically acceptable salt thereof, wherein:

R^1 is hydrogen, C_1–C_6 alkyl, C_3–C_7 cycloalkyl, C_2–C_8 alkoxyalkyl or phenyl optionally substituted by OH, halo, C_1–C_4 alkyl, or C_1–C_4 alkoxy groups; and

X is hydrogen halo, C_1–C_4 alkyl or C_1–C_4 alkoxy.

6. A feed composition for economically important food-source animals comprising a nutritionally balanced feed composition incorporating a growth promoting or feed utilization improving amount of a compound according to claim **1**.

4,562,198

COMBATING FUNGI WITH SUBSTITUTED AZOLYL-TETRAHYDRO-FURAN-2-YLIDENE-METHANE DERIVATIVES

Hans-Ludwig Elbe, Wuppertal; Manfred Jautelat; Karl H. Büchel, both of Burscheid; Wilhelm Brandes, Leichlingen; Gerd Hänssler, and Paul Reinecke, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 5, 1984, Ser. No. 658,344

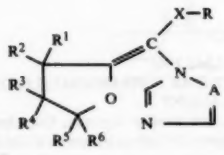
Claims priority, application Fed. Rep. of Germany, Oct. 11, 1983, 3336859

The portion of the term of this patent subsequent to Dec. 11, 2001, has been disclaimed.

Int. Cl.⁴ A01N *43/50, 43/653;* C07D *233/60, 249/08*

U.S. Cl. 514—383 **10 Claims**

1. A substituted azolyl-tetrahydrofuran-2-ylidene-methane derivative of the formula



in which

A represents a nitrogen atom or the CH group;

X represents oxygen, sulphur or the SO or SO_2 group;

R represents phenyl which is optionally mono-, di- or tri-substituted by identical or different substituents selected from the group consisting of halogen, alkyl with 1 to 4 carbon atoms, alkoxy and alkylthio with in each case 1 or 2 carbon atoms, halogenoalkyl, halogenoalkoxy and halogenoalkylthio with in each case 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms, alkoxycarbonyl with 1 to 4 carbon atoms in the alkoxy part, alkoximinoalkyl with 1 to 4 carbon atoms in the alkoxy part and 1 or 2 carbon atoms in the alkyl part, nitro, cyano and phenyl and phenoxy which are optionally substituted by halogen and/or alkyl with 1 or 2 carbon atoms;

R^1 to R^6, which can be identical or different, represent hydrogen, straight-chain or branched alkyl with 1 to 4 carbon atoms or halogenoalkyl with 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms, up to a maximum of 3 substituents representing halogenoalkyl, with the proviso that R^1 and R^2 do not at the same time represent methyl if X represents oxygen; or

R^3 to R^6, which can be identical or different, also represent halogen, up to a maximum of 3 substituents having this meaning; or

R^1 and R^2, together with the carbon atom to which they are bonded, represent cycloalkyl which has 4 to 7 carbon atoms and is optionally substituted by alkyl with 1 or 2 carbon atoms; or

R^2 and R^3, together with the carbon atom to which they are bonded, represent cycloalkyl which has 4 to 7 carbon atoms and is optionally substituted by alkyl with 1 or 2 carbon atoms,

or an addition product thereof with an acid or metal salt.

9. A method of combating fungi which comprises administering to such fungi or to a habitat thereof a fungicidally effective amount of a compound or addition product thereof according to claim **1**.

4,562,199

IMIDAZOLE DERIVATIVES, COMPOSITIONS AND USE

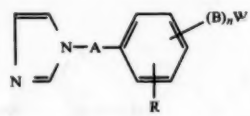
Peter B. Thorogood, 2 Lansdowne Gardens, London, S.W.8., and Jeremy G. Vinter, Bailey's Glen, Weston, Hitchin, Herts, both of England

Filed Aug. 11, 1983, Ser. No. 522,228

Int. Cl.⁴ A61K *31/415;* C07D *233/60*

U.S. Cl. 514—399 **19 Claims**

1. Compounds of the general formula



(I)

wherein

R is $(Hal)_m$ wherein Hal represents a halogen atom and m is 1 or 2,

W represents a carboxyl or esterified carboxyl,

n is 1, A represents a straight chain or branched C_{1-3} alkylene group, B represents a C_{2-3} alkenylene group and physiologically acceptable salts thereof.

12. A method for the treatment or prophylaxis of thromboembolic disorders in a mammal which comprises administering to the mammal an effective amount of a compound of formula (I) (as defined in claim **1**) or a physiologically effective salt thereof.

4,562,200
5(INDOLYL) AND 5(2,3-DIHYDROINDOLYL) SUBSTITUTED AMINOETHANOLS AND THEIR USE AS ANTI-HYPERTENSIVES

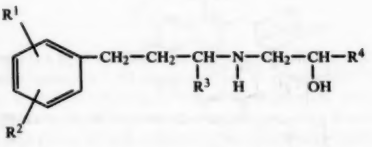
Andre A. Asselin, St. Laurent; Danilo A. Crosilla, Ile Bizard, and Leslie G. Humber, Dollard-des-Ormeaux, all of Canada, assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 509,888, Jun. 30, 1983, Pat. No. 4,521,606. This application Oct. 23, 1984, Ser. No. 648,418

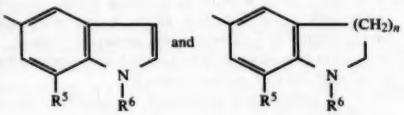
Int. Cl.[4] A16K *31/40;* **C07D** *209/12*

U.S. Cl. 514—415 **6 Claims**

1. A compound of the formula



in which R^1 and R^2 each is hydrogen, halogen or lower alkoxy, or adjacent R^1 and R^2 are joined together to form a methylenedioxy chain; R^3 is lower alkyl containing one to three carbon atoms; and R^4 is a heterocycle selected from the group consisting of



wherein n is the integer 1; R^5 is carboxamide and R^6 is hydrogen or lower alkyl; or a therapeutically acceptable acid addition salt thereof.

5. A method of treating hypertension in a hypertensive mammal, which comprises administering to said mammal an effective antihypertensive amount of a compound of claim 1.

4,562,201
AMINOMETHYL BENZANILIDES

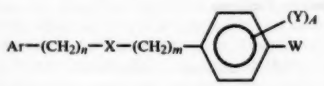
David M. Stout, Vernon Hills, and William L. Matier, Libertyville, both of Ill., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Jul. 26, 1982, Ser. No. 401,751

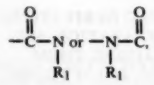
Int. Cl.[4] C07D *207/06, 413/10, 401/10;* **A61K** *31/40*

U.S. Cl. 514—422 **18 Claims**

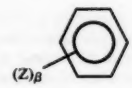
1. A compound of the formula



wherein X is

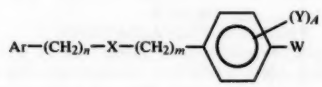


wherein R_1 is hydrogen, lower alkyl, phenyl, or benzyl; W is hydrogen or hydroxy; $(Y)_A$ is positioned ortho to W and is an aminoloweralkyl having the formula $—CH_2NR_2R_3$ where R_2 and R_3 are the same or different and may be lower alkyl or R_2 and R_3 may together with N form a pyrrolidine, ring, and A is 2; n and m are independently from 0 to 5; and Ar is phenyl or cinnamoyl optionally fused with a phenyl group, unsubstituted or substituted with 1 to 3 substituents each of which is independently halo, lower alkyl, lower alkoxy, halololoweralkyl, amino, aminoloweralkyl, nitro, cyano, carbamoyl, amino, hydroxy, cyclololoweralkyl, lower alkenyl, lower alkynyl, or phenyl; with the proviso that when Ar is phenyl that phenyl is represented by the formula

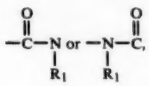


wherein $(Z)_\beta$ is independently halo, lower alkyl, lower alkoxy, halololoweralkyl, amino, aminoloweralkyl, nitro, cyano, carbamoyl, amido, hydroxy, cyclololoweralkyl, lower alkenyl, lower alkynyl, or phenyl; and β is from 0 to 3 with the proviso that when β is 1 and $(Z)_\beta$ is positioned para to $—(CH_2)n—$, that $(Z)_\beta$ is halo, lower alkoxy, halololoweralkyl, amino, aminoloweralkyl, nitro, cyano, carbamoyl, amido, hydroxy, cyclololoweralkyl, lower alkenyl, lower alkynyl, or phenyl; with the proviso that when β is 3 that $(Z)_\beta$ is halo, lower alkyl, halololoweralkyl, amino, nitro, cyano, carbamoyl, amido, hydroxy, cyclololoweralkyl, lower alkenyl, lower alkynyl, or phenol; or a pharmaceutically acceptable salt thereof.

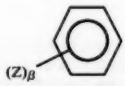
12. A method of treating cardiac arrhythmias in a patient by administration of an anti-arrhythmic effective amount to such patient of a compound having the formula



where x is



wherein R_1 is hydrogen, lower alkyl, phenyl, or benzyl; W is hydrogen, or hydroxy; $(Y)_A$ is positioned ortho to W and is $—CH_2—NR_2R_3$, wherein R_2 and R_3 are the same or different and may be lower alkyl or R_2 and R_3 may together with N form a pyrrolidine group, and A is 2; n and m are independently from 0 to 5; and Ar is phenyl c cinnamoyl optionally fused with a phenyl group, unsubstituted or substituted with 1 to 3 substituents each of which is independently halo, lower alkyl, lower alkoxy, haloalkyl, amino, aminoloweralkyl, nitro, cyano, carbamoyl, amino, hydroxy, cyclolowerakyl, lower alkenyl, lower alkynyl, or phenyl; with the proviso that when Ar is phenyl that phenyl is represented by the formula



wherein $(Z)_\beta$ is independently halo, lower alkyl, lower alkoxy, halololoweralkyl, amino, aminoloweralkyl, nitro, cyano, carbamoyl, amido, hydroxy, cyclololoweralkyl, lower alkenyl, lower alkynyl, or phenyl; and β is from 0 to 3 with the proviso that when β is 1 and $(Z)_\beta$ is positioned para to $—(CH_2)n—$, that $(Z)_\beta$ is halo, lower alkoxy, halololoweralkyl, amino, aminoloweralkyl, nitro, cyano, carbamoyl, amido, hydroxy, cyclololoweralkyl, lower alkenyl, lower alkynyl, or phenyl; with the proviso that when β is 3 that $(Z)_\beta$ is halo, lower alkyl, halololoweralkyl, amino, nitro, cyano, carbamoyl, amido, hydroxy,

cyclolower-alkyl, lower alkenyl, lower alkynyl, or phenol; or a pharmaceutically acceptable salt thereof.

4,562,202

N-ACYL HEXAHYDROINDOLE-2-CARBOXYLIC ACIDS AND ANTI-HYPERTENSIVE USE THEREOF

Hansjörg Urbach, Kronberg; Rainer Henning, Frankfurt am Main; Volker Teetz, Hofheim am Taunus; Hans Wissmann, Bad Soden am Taunus, and Reinhard Becker, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

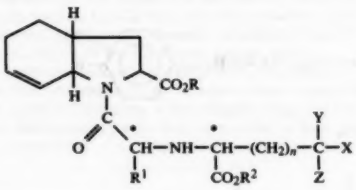
Filed Mar. 21, 1983, Ser. No. 477,333

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1982, 3210496

Int. Cl.⁴ A61K *31/40;* **C07D** *209/42*

U.S. Cl. 514—423 **12 Claims**

1. A compound of the formula I,



(I)

in which

n denotes 0 to 1,

R denotes hydrogen, (C_1 to C_6)-alkyl or aralkyl having 7 to 9 C atoms,

R^1 denotes hydrogen or (C_1 to C_6)-alkyl, which can optionally be substituted by amino, (C_1 to C_4)-acylamino or benzoylamino, (C_2 to C_6)-alkenyl, (C_5 to C_9)-cycloalkyl, (C_5 to C_9)-cycloalkenyl, (C_5 to C_7)-cycloalkyl-(C_1 to C_4)-alkyl, (C_6–C_{10})-aryl or partially hydrogenated (C_6–C_{10})-aryl, which each can be substituted by (C_1 to C_4)-alkyl, (C_1 or C_2)-alkoxy or halogen, (C_6–C_{10})-aryl(C_1 to C_4)-alkyl or (C_7–C_{11})-aroyl-C_1-alkyl, both of which can be substituted in the aryl, radical as defined in the aforegoing or a

side chain of a naturally occuring aminoacid,

R^2 denotes hydrogen, (C_1 to C_6)-alkyl, (C_2 to C_6)alkenyl or aryl-(C_1 to C_4)-alkyl,

Y denotes hydrogen or hydroxyl

Z denotes hydrogen or

Y and Z together denote oxygen,

X denotes (C_1 to C_6)-alkyl, (C_2 to C_6)-alkenyl, (C_5 to C_9)-cycloalkyl, (C_6–C_{10})-aryl, which can be monosubstituted, disubstituted or trisubstituted by (C_1 to C_4)alkyl, (C_1 to C_4)-alkoxy, hydroxyl, halogen, nitro, amino, (C_1 to C_4)-alkylamino, di-(C_1 to C_4)-alkylamino or methylenedioxy, or 3-indolyl, and

aryl denotes phenyl or naphthyl

and its physiologically acceptable salts.

10. A method of treating hypertension comprising administering an effective amount of a compound claimed in claim 1 or a physiologically acceptable salt thereof.

4,562,203

RIFAMYCINS DERIVATIVES AND PREPARATION AND PHARMACEUTICAL COMPOSITIONS THEREOF

Tiberio Bruzzese; Ernani Dell'Acqua, and Holger H. Van Den Heuvel, all of Milan, Italy, assignors to SPA Societa Prodotti Antibiotici S.p.A., Italy

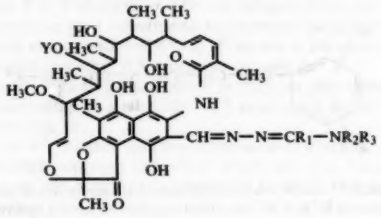
Filed Mar. 14, 1984, Ser. No. 589,335

Claims priority, application Italy, Mar. 24, 1983, 20278/83

Int. Cl.⁴ A61K *31/395;* **C07D** *498/08*

U.S. Cl. 514—468 **20 Claims**

1. A rifamycin derivative corresponding to the following formula (I)



wherein:

Y = H or CH_3—CO;

R_1 is an alkyl group with up to 4 carbon atoms;

R_2 is an alkyl group with up to 6 carbon atoms, an alkenyl group with up to 5 carbon atoms, a cycloalkyl group having from 5 to 7 carbon atoms, phenyl or benzyl;

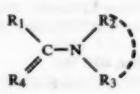
R_3 is an alkyl grouup with up to 6 carbon atoms or an alkenyl group with up to 5 carbon atoms; or

$—NR_2R_3$ is pyrrolidinyl piperidinyl, hexahydroazepinyl or morpholinyl.

9. A process for the preparation of a compound of formula (I) according to claim 1, comprising preparing a compound of formula

$$NH_2—N{=}CR_1—NR_2R_3 \qquad \text{(III)}$$

wherein R_1, R_2 and R_3 have the defined meaning, by reacting hydrazine with a reactive derivative of an amide or thioamide of formula



(II)

wherein R_4 = O or S, and reacting such compound of formula (III) with 3-formyl-rifamycin SV in chloroform, methylene chloride or tetrahydrofuran.

4,562,204

TRANS-Δ^2-PROSTAGLANDIN D DERIVATIVES, PROCESS FOR THEIR PREPARATION AND COMPOSITIONS CONTAINING THEM

Hirohisa Wakatsuka; Takashi Yamato, both of Takatsuki, and Shinsuke Hashimoto, Ibaraki, all of Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka, Japan

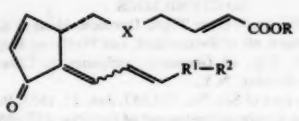
Filed Jun. 28, 1983, Ser. No. 508,560

Claims priority, application Japan, Jun. 30, 1982, 57-112756

Int. Cl.⁴ C07C *177/00;* **A61K** *31/557*

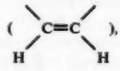
U.S. Cl. 514—530 **20 Claims**

1. A trans-Δ^2-prostaglandin D derivative of the formula:



(Ic)

wherein X represents an ethylene group (—CH_2CH_2—) or a cis-vinylene group



R represents a hydrogen atom or a straight-chain or branched-chain alkyl group of 1–12 carbon atoms, R^1 represents a single bond or a straight-chain or branched-chain alkylene group of 1–5 carbon atoms, R^2 represents a straight-chain or branched-chain alkyl group of 1–8 carbon atoms, a cycloalkyl group of 4–7 carbon atoms either unsubstituted or substituted by at least one straight-chain or branched-chain alkyl group of 1–8 carbon atoms or represents a phenyl group or phenoxy group either unsubstituted or substituted by at least one halogen atom, trifluoromethyl group or straight-chain or branched-chain alkyl group of 1–4 carbon atoms, the double bond between C_2–C_3 is E, the double bond between C_9–C_{10} is Z, and the double bonds between C_{12}–C_{13} and between C_{14}–C_{15}, which may be in the same or different configurations, are E, Z or a mixture thereof, provided that when R^1 represents a single bond, R^2 does not represent a substituted or unsubstituted phenoxy group, or a cyclodextrin clathrate thereof, or, when R represents a hydrogen atom, a non-toxic salt thereof.

4,562,205

DERIVATIVES OF 2-AMINOACETIC ACID

Robert G. Cavalier, Rixensart; Alexis A. Cordi, Gistoux; Claude L. Gillet, Blanmont; Philippe M. Janssens de Varebeke, Bossut-Gottechain; Paul J. Niebes, Grez-Doiceau; Joseph L. Roba, Dion-Valmont; William R. Van Dorsser, Court-St-Etienne; Georges E. Lambelin, and Michel R. Franz, both of Brussels, all of Belgium, assignors to Continental Pharma Inc., Brussels, Belgium

Filed Jun. 25, 1984, Ser. No. 624,110

Claims priority, application Luxembourg, Jun. 30, 1983, 84891

Int. Cl.⁴ A61K *31/195*

U.S. Cl. 514—546 **8 Claims**

1. A method for treating epilepsy, dyskinesiae, Parkinsonism, memory troubles, depression or cerebral anoxia, which comprises administering to a host in need for such a treatment a therapeutically effective amount of 2-pentanoylaminoacetic acid or a pharmaceutically acceptable salt thereof as the therapeutically active substance optionally with a pharmaceutically acceptable carrier or diluent.

4,562,206

ORALLY EFFECTIVE INOTROPIC COMPOUNDS

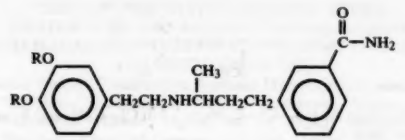
Ronald R. Tuttle, Plantation, Fla., assignor to Key Pharmaceuticals, Inc., Miami, Fla.

Continuation of Ser. No. 564,858, Dec. 23, 1983, abandoned. This application Mar. 8, 1984, Ser. No. 587,444

Int. Cl.⁴ C07C *103/29, 69/017;* **A61K** *31/165, 31/225*

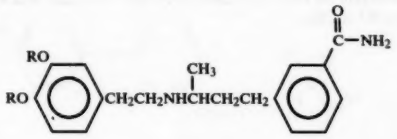
U.S. Cl. 514—548 **12 Claims**

1. A compound of the formula



where R is hydrogen or isobutyrate, or a pharmaceutically acceptable acid addition salt thereof.

6. A method for increasing cardiac contractility in a warm-blooded animal suffering from depressed cardiac contractility which comprises administering to said animal an effective amount of a compound of the formula



wherein R is hydrogen or isobutyrate, or a pharmaceutically acceptable acid addition salt thereof.

4,562,207

PROSTAGLANDIN ANALOGUE

Katsuhiro Imaki, Tsuzuki; Takashi Muryobayashi, Takatsuki, and Akiyoshi Kawasaki, Osaka, all of Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka, Japan

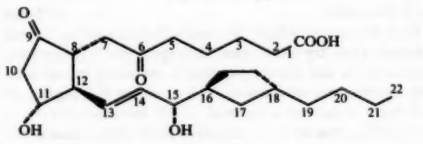
Filed Mar. 8, 1984, Ser. No. 587,634

Claims priority, application Japan, Mar. 8, 1983, 58-36625

Int. Cl.⁴ C07C *177/00;* **A61K** *31/557*

U.S. Cl. 514—573 **5 Claims**

1. A prostaglandin analogue of the formula:



(III)

[wherein, the symbol ◄ represents β-configuration, the dotted line - - - represents α-configuration, and the double bond between C_{13}–C_{14} is in trans-configuration] or a cyclodextrin clathrate thereof, or a non-toxic salt thereof.

4,562,208

N-SULPHENYLATED UREAS, MICROBICIDAL AGENTS CONTAINING THESE COMPOUNDS AND THEIR USE

Engelbert Kühle, Bergisch Gladbach; Wilfried Paulus; Hermann Genth, both of Krefeld; Wilhelm Brandes, Leichlingen, and Paul Reinecke, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

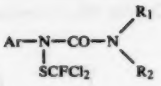
Filed Feb. 15, 1983, Ser. No. 466,694

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1982, 3207474

Int. Cl.⁴ C07C *145/04;* **A01N** *47/28*

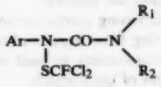
U.S. Cl. 514—593 **4 Claims**

1. A N-sulphenylated urea of the formula



and wherein Ar is 4—Cl—C_6H_5 or 3,4 di Cl—C_6H_5 and R^1 and R^2 are both CH_3.

2. A N-sulphenylated urea of the formula



and wherein Ar is 4—Cl—C_6H_5 or 3,4 di—Cl—C_6H_5 and R^1 is H and R^2 is CH_3.

4,562,209

PROMOTION OF FEED EFFICIENCY IN ANIMALS

Billy J. Chou, Paoli, Pa., assignor to William H. Rorer, Inc., Fort Washington, Pa.

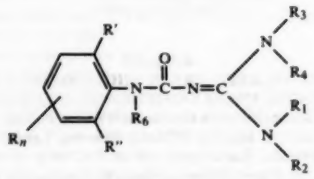
PCT No. PCT/US81/01145, § 371 Date Jul. 1, 1982, § 102(e) Date Jul. 1, 1982, PCT Pub. No. WO83/00624, PCT Pub. Date Mar. 3, 1983

Continuation-in-part of Ser. No. 109,848, Jan. 7, 1980, abandoned. This PCT application Aug. 24, 1981, Ser. No. 425,093

Int. Cl.⁴ A61K *31/17*

U.S. Cl. 514—596 **6 Claims**

1. In a process in which the feed efficiency of an animal population of poultry is increased the improvement comprising administering to said animal population, including in said population healthy animals, about 0.01 to about 0.1 mg/kg of animal body weight of a material which increases the dwell time of nutrient matter in the digestive tract of said animal, the administration of said material being for a period of time sufficient to effect an increase in the digestion and absorption of said nutrients over and above that which would have been effected had the animal not assimilated said material wherein said material is an amidinourea of the formula



wherein R_1, R_2, R_3 and R_4 are hydrogen, halo lower alkyl, lower alkoxy, or lower alkyl; R_6 is hydrogen or lower alkyl; R' and R'' are hydrogen, lower alkyl, lower alkoxy, halo or halo lower alkyl; R is hydrogen, lower alkyl, halo, lower alkoxy, nitro, amino or halo lower alkyl and, n is 0–3; and, the edible salts thereof.

4,562,210

BACTERICIDES

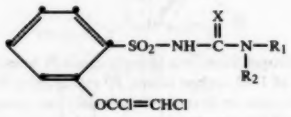
Willy Meyer, Riehen; Werner Töpfl, Dornach; Haukur Kristinsson, Bottmingen, all of Switzerland, and Wolfgang Eckhardt, Lörrach, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 458,587, Jan. 17, 1983, Pat. No. 4,443,245, and a continuation-in-part of Ser. No. 458,696, Jan. 17, 1983, Pat. No. 4,425,154. This application Dec. 21, 1983, Ser. No. 563,841

Int. Cl.⁴ C07C *127/19, 157/09*

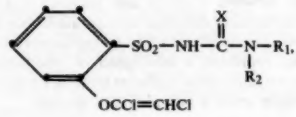
U.S. Cl. 514—604 **10 Claims**

1. A compound of the formula



in which X is oxygen or sulfur; R_1 is hydrogen, C_1–C_{12}-alkyl, C_2–C_6-alkenyl or C_2–C_6-alkynyl; and R_2 is hydrogen, C_1–C_{12}-alkyl, C_2–C_6-alkenyl, C_2–C_6-alkynyl or C_1–C_6-alkoxy; and the salts of this compound.

10. A method of combating phytopathogenic bacteria, which comprises applying a bactericidally active amount of a compound of the formula



in which X is oxygen or sulfur, R_1 is hydrogen, C_1–C_{12}-alkyl, C_2–C_6-alkenyl or C_2–C_6-alkynyl; and R_2 is hydrogen, C_1–C_{12}-alkyl, C_2–C_6-alkenyl, C_2–C_6-alkynyl or C_1–C_6-alkoxy; or a salt of this compound, to the plants or their location.

4,562,211

PHARMACEUTICALLY ACTIVE 2-SUBSTITUTED-1-(OMEGA-AMINOALKOXY)BENZENES

Ryoji Kikumoto, Machida; Akihiro Tobe, Kawasaki; Shinji Tonomura, Tokyo, and Hidenobu Ikoma, Kawasaki, all of Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

Continuation of Ser. No. 853,743, Nov. 21, 1977, abandoned. This application Nov. 16, 1979, Ser. No. 94,762

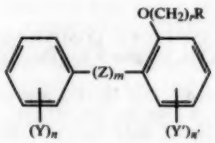
Claims priority, application Japan, Dec. 6, 1976, 51-146254; Dec. 17, 1976, 51-151632

The portion of the term of this patent subsequent to May 17, 1994, has been disclaimed.

Int. Cl.⁴ A61K *31/135, 31/205*

U.S. Cl. 514—648 **15 Claims**

1. A method for palliating conditions of depression in warm-blooded animals which comprises administering to said animal an antidepressant effective amount of a compound of the formula (II):



(II)

wherein R is (1)

wherein R_1 and R_2 which are alike or different are selected from the group consisting of hydrogen, C_1–C_5 alkyl and C_1–C_5 hydroxyalkyl or (2) C_3–C_7 N,N-polymethyleneiminyl, morpholino, thiomorpholino, 4-oxothiomorpholino, 1-piperazinyl, 4-methyl-1-piperazinyl, 4-ethyl-1-piperazinyl or 4-acetyl-1-piperazinyl; Y and Y′ which are alike or different are selected from the group consisting of hydrogen, halo, hydroxy, trifluoromethyl, C_1–C_5 alkyl or C_1–C_5 alkoxy with the proviso that both Y and Y′ are not hydrogen; Z is oxy, thio, methylene, monosubstituted methylen

wherein R_3 is C_1–C_5 alkyl, or disubstituted methylene

wherein R_4 and R_5 are C_1–C_5 alkyl; r is an integer of 3, 4 or 5; m is 1; n is an integer of 1 to 5; and n′ is an integer of 1 to 4, or the acid addition salts thereof.

4,562,212

METHOD FOR REPELLING BIRDS, ESPECIALLY WOODPECKERS

Samuel J. Tomlinson, Sr.; Edward E. Dean, and Leon M. Adams, all of San Antonio, Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Division of Ser. No. 365,102, Apr. 2, 1982, Pat. No. 4,414,227, which is a continuation of Ser. No. 171,152, Jul. 22, 1980, abandoned. This application Oct. 31, 1983, Ser. No. 547,040

The portion of the term of this patent subsequent to Nov. 8, 2000, has been disclaimed.

Int. Cl.⁴ A01N *35/00*

U.S. Cl. 514—690 **8 Claims**

1. A method for repelling woodpeckers from a surface comprising selecting a surface from which it is desired to repel woodpeckers and applying to said surface a repelling amount of a compound of the formula

wherein R is a methyl, ethyl or propyl group.

4,562,213

CERTAIN PHENOXY-BENZYLOXY ETHER DERIVATIVES AND AN INSECTICIDAL AND/OR ACARICIDAL COMPOSITION CONTAINING THE SAME AND METHODS OF USE

Sumio Nishida, Takarazuka; Noritada Matsuo, Itami; Kazunori Tsushima, Nishinomiya; Makoto Hatakoshi, Minoo, and Masachika Hirano, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

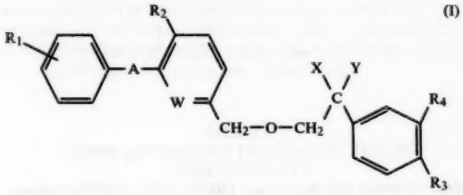
Filed May 5, 1983, Ser. No. 491,727

Claims priority, application Japan, May 12, 1982, 57-80510; Dec. 13, 1982, 57-218819

Int. Cl.⁴ C07D *213/64;* **C07C** *43/20;* **A01N** *43/40, 31/14*

U.S. Cl. 514—721 **19 Claims**

1. A compound of the formula,



(I)

wherein W represents CH or nitrogen, and

(1) when W is CH, R_1 represents hydrogen, fluorine, chlorine, bromine or methyl, R_2 represents hydrogen or fluorine, R_3 and R_4 are same or different and represent hydrogen, halogen, C_{1-4} alkyl, a C_{1-4} alkoxy, difluoromethoxy or 2,2,2-trifluoroethoxy, or represent, taken together, methylenedioxy, A represents oxygen, and X and Y represent, taken together, ethylene or 1,1-difluoroethylene which form a cyclopropyl ring or a 1,1-difluorocyclopropyl ring with a carbon to which they are attached, and

(2) when W is nitrogen, both R_1 and R_2 represent hydrogen, and R_3, R_4, A, X and Y are as defined above.

4,562,214

PERSONAL CARE EMULSION

Graham Barker, Fair Lawn, and Martin J. Barabash, Montvale, both of N.J., assignors to Witco Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 74,023, Sep. 10, 1979, abandoned. This application Jan. 28, 1981, Ser. No. 229,238

Int. Cl.⁴ A61K *47/00;* **B01J** *13/00*

U.S. Cl. 514—844 **7 Claims**

1. A stable W/O emulsified cosmetic personal care preparation which comprises about 2.5 to about 75.0 percent by weight cosmetic emulsion oil, about 0.5 to about 7.5 percent by weight oxidized refined petrolatum, said oxidized refined petrolatum being characterized in that it has an Acid No. (ASTM D-974) of 15 to 100, a Saponification No. of 75 to 150, and a Lovibond Color, 2″ Cell, of 40y, 5r to 9r, about 0.2 to about 2.0 percent by weight of a polyvalent cationic water-soluble metal salt capable of enhancing the formation of W/O emulsions, and the balance of the preparation is water, the aforesaid concentrations being based upon the total weight, percentagewise, of the preparation.

4,562,215
FILLED THERMOPLASTICS

Moira A. Carter, and Kenneth Barrell, both of Stourbridge, England, assignors to BIP Chemicals Limited, Manchester, England

Filed Sep. 13, 1984, Ser. No. 650,079
Claims priority, application United Kingdom, Sep. 24, 1983, 8325606
Int. Cl.⁴ C08K *3/26, 3/22*
U.S. Cl. 523—220 **8 Claims**

1. A filled thermoplastics moulding composition suitable for injection molding which comprises a thermoplastics polymer, a first particulate inorganic filler having a particle size less than 1 micron in an amount greater than 25 percent by weight of the total composition and a second filler having a particle size different from that of the first filler but less than 2 microns.

4,562,216
FLAME RETARDANT POLYESTER RESIN COMPOSITIONS

Kazuo Kishida; Isao Sasaki, and Hiroshi Mori, all of Hiroshima, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 400,250, Jun. 17, 1982, abandoned. This application Jan. 5, 1984, Ser. No. 568,531
Claims priority, application Japan, Jul. 31, 1981, 56-121201
Int. Cl.⁴ C08L *67/02*
U.S. Cl. 523—433 **8 Claims**

1. A flame retardant glass fiber reinforced polyester resin composition comprising:

A. 100 parts by weight of a thermoplastic linear polyester composed of ethylene terephthalate units;

B. from about 1 to about 20 parts by weight of a first flame retardant component of the formula (I);

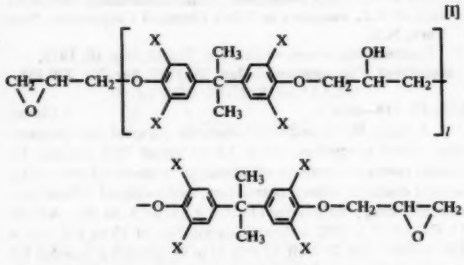
C. from about 2 to about 40 parts by weight of a second flame retardant component of the formula (II);

provided that the first and second fire retardant components are blended together so that the weight ratio of (I)/(II) is in the range of $0<(I)/(II)\leqq 5$, and further that the total of the first and second flame retardant components (I) and (II) is from about 3 to about 40 parts by weight;

D. from about 2 to about 30 parts by weight of antimony trioxide, and

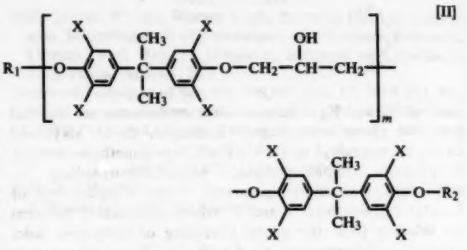
E. from about 5 to about 60 percent by weight of glass fiber based upon the total amount of the resin composition, the first flame retardant component is represented by the formula (I):

[I]



in which X represents hydrogen, chlorine or bromine and l has an average value from 0 to 11 and the halogen content is at least 10% by weight; and the second flame retardant component is represented by the formula (II):

[II]



in which X represents hydrogen, chlorine or bromine and m has an average value from 0 to 11 and the halogen content is at least 10% by weight, and R_1 and R_2 are both independently (1) the reaction product of the terminal glycidyl group of a compound represented by formula (I) with a halogenated alcohol or when only one of R_1 or R_2 is (1) the other is a glycidyl group.

4,562,217
CURABLE EPOXY RESIN COMPOSITIONS

Kevin Hirschbuehler, Bel Air, Md., assignor to American Cyanamid, Stamford, Conn.

Filed Aug. 1, 1983, Ser. No. 518,873
Int. Cl.⁴ C08K *3/36, 3/04*
U.S. Cl. 523—466 **6 Claims**

1. A fiber resin matrix composition comprised of:

(a) reinforcing filaments, and

(b) a heat-curable epoxy resin composition formed of the following materials:

(i) N,N,N',N'-tetraglycidyl-4,4'-diaminodiphenyl methane;

(ii) tetraglycidoxy tetraphenylethane;

(iii) an effective epoxide curing amount of trimethylene bis-(p-aminobenzoate); and

(iv) a small, catalytic amount of the reaction product of toluenediisocyanate and dimethylamine.

4,562,218
FORMABLE PULP COMPOSITIONS

J. Stephen Fornadel, Millersville, and Harry F. Long, East Hempfield Township, Lancaster County, both of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Continuation-in-part of Ser. No. 429,243, Sep. 30, 1982, abandoned. This application Sep. 16, 1983, Ser. No. 532,351
Int. Cl.⁴ B32B *23/04, 23/06, 23/08;* **D21F** *1/82*
U.S. Cl. 524—15 **54 Claims**

1. A cellulosic composition useful to prepare articles having a desired configuration, said composition comprising by weight 100 parts of thermoplastic or theromostet primary binder, from about 25 to about 700 parts of newsprint, from about 25 to about 500 parts of sulfite pulp, from about 25 to about 500 parts of vegetable shell flour, and a suitable quantity of water.

29. A process for preparing cellulosic articles having a desired configuration, said process comprising the steps of

preparing an aqueous slurry comprising by weight from about 25 to about 700 parts of newsprint, from about 25 to about 500 parts of sulfite pulp, from about 25 to about 500 parts of vegetable shell flour, and optional components;

adjusting the pH as necessary to cause precipitation of a subsequently added thermoplastic or thermoset primary binder onto the solid components of said slurry;

dispersing 100 parts of said primary binder in said slurry;

disposing said slurry in a desired configuration;

removing excess water to form a preshaped article; and

drying said preshaped article.

4,562,219

DUAL COMPONENT COATING SYSTEM

Robert B. Frye, Albany, N.Y., assignor to General Electric Company, Waterford, N.Y.

Division of Ser. No. 327,448, Dec. 4, 1981, Pat. No. 4,477,519. This application Jul. 27, 1984, Ser. No. 634,971
The portion of the term of this patent subsequent to Oct. 16, 2001, has been disclaimed.
Int. Cl.[4] C08K 5/34
U.S. Cl. 524—91 10 Claims

1. A two-part article of manufacture consisting of:

(a) a primer solution, comprising from 2% to 6% polymethylmethacrylate dissolved in a mixture of an ether solvent and ketone solvent containing an ultraviolet light absorbing compound, or a combination of an ultraviolet light absorbing compound and an ultraviolet radiation stabilizing agent; and

(b) a silicone resin coating composition comprising a dispersion of colloidal silica in an alcohol-water solution of the partial condensate of a silanol of the formula $RSi(OH)_3$, wherein R is selected from the group consisting of alkyl having from 1 to 3 carbon atoms and aryl, wherein at least 70 weight percent of the silanol is $CH_3Si(OH)_3$, said composition containing 10 to 50 weight percent solids, said solids consisting essentially of 10 to 70 weight percent colloidal silica and 30 to 90 weight percent of the partial condensate, said silicone resin coating composition further containing an effective amount of an ultraviolet light absorbing compound which is not the same as that employed in part (a) and is matched with said ultraviolet light absorbing compound or said combination of part (a) so as to effectively increase the resistance of a substrate to ultraviolet radiation when parts (a) and (b) are sequentially applied thereto.

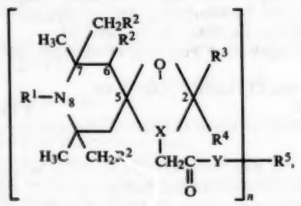
4,562,220

POLYALKYLDIAZASPIRODECANYLACETIC ACID DERIVATIVES, A PROCESS FOR THEIR PREPARATION AND THEIR USE AS LIGHT STABILIZERS FOR ORGANIC POLYMERS

Hartmut Wiezer, Lützelburg, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 490,540, May 2, 1983, abandoned. This application Apr. 17, 1983, Ser. No. 723,718
Claims priority, application Fed. Rep. of Germany, May 12, 1982, 3217734
Int. Cl.[4] C07D 498/10, 498/20, 211/78; C08K 5/35
U.S. Cl. 524—95 11 Claims

1. A polyalkyldiazaspirodecanylacetic acid derivative of the general formula (I)



(I)

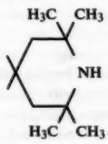
in which X denotes a group of the formula (II) or (III)

(II)

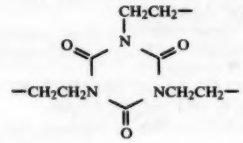
-continued

(III)

in which the indices 3 and 4 indicate the ring position in the diazaspirodecane system, and the free valency of the nitrogen atom 3 or 4 effects the linkage with the acetic acid radical, R^1 is H, O or C_1 to C_{12} alkyl, R^2 is H or a C_1 to C_5 alkyl group, R^3 and R^4 are identical or different and represent H, a C_1 to C_{30} alkyl group, a phenyl or naphthyl group which can be substituted by chlorine or C_1 to C_4 alkyl, or a C_7 to C_{12} phenylalkyl group which can be substituted by C_1 to C_4 alkyl, or R^3 and R^4, together with the carbon atom linking them, also denote a C_5 to C_{18} cycloalkyl group which can be substituted by up to four C_1 to C_4 alkyl groups, or a group of the formula



n represents an integer from 1 to 6 and, if n=1, R^5 denotes H, C_1 to C_{18} alkyl, C_3 to C_{12} alkenyl, C_7 to C_9 phenylalkyl which can be substituted by C_1 to C_4 alkyl, or a 2,2,6,6-tetramethyl-4-piperidinyl group, if n=2, R^5 is C_2 to C_{30} alkylene, a C_4 to C_8 alkenylene group, a C_2 to C_{12} bis-(propyleneoxy)-alkylene group or a monocycloalkylene, dicycloalkylene or tricycloalkylene which has 6 to 18 carbon atoms and which can be substituted by up to four methyl groups, it being possible, in the case first mentioned, for two carbon atoms to be replaced by nitrogen atoms which can carry propylene groups, or R^5 is C_6 to C_{18} arylene or C_7 to C_{18} aralkylene, if n=3, R^5 denotes C_3 to C_6 alkanetriyl or a radical of the formula



or a di-C_2-alkylenetriamino to di-C_4-alkylenetriamino radical and, if n=4 to 6, R^5 represents a C_4 to C_{10} alkan-n-yl radical which can contain an ether group, or represents a tri-C_2 to C_4 alkylenetetra-bis-hexamino to penta-C_2 to C_4-alkylenetetra-bis-hexamino radical, and Y is —O— or

in which R^6 has one of the meanings indicated under R^5 in the case where n=1.

4. A compound as claimed in claim 1 in which Y is —O—.

4,562,221

POLYAMIDE RESIN COMPOSITION EXCELLENT IN PLATE ADHESION

Hideyuki Shigemitsu, Tokyo, Japan, assignor to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Jun. 27, 1984, Ser. No. 625,255

Claims priority, application Japan, Jun. 30, 1983, 58-118814

Int. Cl.[4] C08K *3/34*

U.S. Cl. 524—456 **2 Claims**

1. A polyamide resin composition excellent in plate adhesion which consists essentially of 35% to 90% by weight of a polyamide resin, 5% to 60% by weight of a carbon fiber and 5% to 50% by weight of wollastonite.

4,562,222

POLYCARBONATE RESIN MIXTURES

Ping Y. Liu, Naperville, Ill., assignor to General Electric Company, Mt. Vernon, Ind.

Continuation-in-part of Ser. No. 421,788, Sep. 23, 1982, abandoned. This application Dec. 19, 1984, Ser. No. 683,659

Int. Cl.[4] C08L *53/02, 69/00*

U.S. Cl. 524—505 **22 Claims**

1. A resin mixture comprising:

(a) an aromatic polycarbonate resin and

(b) a modifier combination therefor comprising

(i) a coupled resinous block copolymer having blocks comprising polymerized vinyl aromatic units connected to blocks comprising polymerized diene units; and

(ii) a copolymer of an olefin and at least one of a C_1–C_6 alkyl acrylate, a C_1–C_6 alkyl methacrylate, acrylic acid, methacrylic acid, or a mixture of any of the foregoing,

said modifier being present in said mixture in an amount of at least sufficient to impart to said mixture a resistance to environmental stress crazing and cracking greater than that possessed by said polycarbonate resin wherein component (a) comprises from about 50 to about 96 parts by weight; component (b)(i) comprises from about 2 to about 25 parts by weight; and component (b)(ii) comprises from about 2 to about 25 parts by weight, per 100 parts by weight of components (a), (b)(i) and (b)(ii) combined.

4,562,223

DEFOAMING AGENT FOR PLASTIC DISPERSIONS AND DISPERSE COATING MATERIALS AND ITS PREPARATION

Helmut Steinberger, and Werner Clarenz, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 305,652, Sep. 25, 1981, abandoned. This application Aug. 4, 1983, Ser. No. 520,089

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1980, 3038982

Int. Cl.[4] C08L *83/04*

U.S. Cl. 524—506 **3 Claims**

1. In a dispersion comprising a solvent, a plastic, a defoaming agent, a pigment, a pigment wetting agent and a thickening agent, the improvement which comprises employing as said defoaming agent

(a) 80 to 100% by weight of polyoxyalkylenesiloxane copolymer of the formula:

$$[R^1Si(OSiR_2)_n]_mZ_{m-1}(OR^2)_{m+2},$$

in which

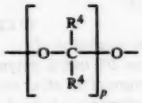
R represents an optionally halogen-substituted alkyl group with up to 4 C atoms,

R^1 represents the substituted R or a phenyl radical,

R^2 represents a group of the composition

$$R^3(OCH_2CH_2)_x(OCH_2\underset{\displaystyle CH_3}{\underset{|}{C}}H)_y-$$

Z represents the difunctional unit —O— or



and

R^3 denotes a hydrocarbon radical with up to 6 C atoms,

R^4 denotes independently of one another hydrogen or R^3,

n denotes a number between 3 and 40,

m denotes a number between 1 and 15,

x denotes a number between 0 and 68,

y denotes a number between 0 and 52,

x+y denotes a number between 1 and 68 and

p denotes a number between 2 and 12, and

(b) 6 to 10% by weight of a hydrophobic silicon dioxide, and employing an acrylate polymer as the plastic.

4,562,224

CHLOROPOLYETHYLENE, PROCESS FOR THE MANUFACTURE THEREOF AND ITS USE

Wolfram Busch, Hochheim am Main; Johannes Brandrup, Wiesbaden, and Dietrich Fleischer, Darmstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 21, 1983, Ser. No. 553,690

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1982, 3243249

Int. Cl.[4] C08F *8/22*

U.S. Cl. 524—519 **7 Claims**

1. Chloropolyethylene having an average molecular weight $\overline{M}_w$ of from 3.3×10^4 to 12×10^6, a chlorine content of from 10 to 50 weight %, a residual crystallinity of from 0 to 40%, a surface hardness of from 35° (Shore A) to 55° (Shore D), an impact resilience of from 5 to 40%, and an average particle size of from 150 to 500 μm, wherein the average particle diameter of the chloropolyethylene differs from that of the starting polyethylene by 15% at most.

4,562,225

THERMOSETTING ADHESIVE AND SEALING COMPOUNDS

Hans Huber, Troisdorf-Spich, and Norbert Vollkommer, Troisdorf-Kriegsdorf, both of Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Troisdorf, Fed. Rep. of Germany

Filed Jan. 23, 1985, Ser. No. 693,787

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1984, 3402280

Int. Cl.[4] C08L *77/00, 79/04*

U.S. Cl. 524—602 **6 Claims**

1. A thermosetting adhesive and sealing composition comprising:

(a) 70 to 95 wt.-%, preferably 80 to 92 wt.-%, of polyesters having a glass transition temperature below 20° C., mixed, if desired, with a polycarboxylic acid anhydride, preferably trimellitic acid anhydride;

(b) 5 to 30 wt.-%, preferably 6 to 18 wt.-%, of polyoxazolines containing at least 2 oxazoline groups per molecule, the polyoxazolines being suspended in the polyesters;

(c) 0 to 4 wt.-%, preferably 1.5 to 3 wt.-%, of paraffin; and

(d) optionally additional 1 to 50%, preferably 1 to 20%, of the total weight of the components, of reactive or nonreactive diluents and/or additives and/or fillers.

4,562,226

COATING COMPOSITIONS

Norman A. Coombes, Maidenhead; Michael R. Wilkinson, Slough, and Charles W. A. Bromley, Bourne End, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Dec. 28, 1983, Ser. No. 566,419

Claims priority, application United Kingdom, Jan. 12, 1983, 8300773

Int. Cl.[4] C08F *222/20;* C08L *35/02*

U.S. Cl. 524—767 12 Claims

1. An aqueous composition suitable for the production upon a substrate of a temporary protective coating which can subsequently be removed by treatment with an aqueous alkaline solution, the composition comprising a sterically stabilized dispersion in an aqueous medium of particles of a size in the range 0.1 to 10 microns of a polymer derived from a monomer mixture comprising (1) at least one acrylic monomer selected from the group consisting of alkyl esters, nitriles and amides of acrylic acid and methacrylic acid and from 5 to 40%, based on the, total weight of (1) and (2), of (2) an ethylenically unsaturated monocarboxylic acid, or a proportion equivalent thereto, in terms of carboxyl group content, of an ethylenically unsaturated polycarboxylic acid, the said dispersion being obtained by free radical-initiated polymerization of (1) and (2) in an aqueous medium which is a mixture comprising (a) at least 30% by weight of water and (b) not more than 70% by weight of a second constituent which is miscible with water, the nature and proportion of the second constituent being such that the aqueous medium as a whole is capable of dissolving (1) and (2) to the extent of at least 3% by weight but is a non-solvent for the polymer formed, the polymerization being carried out at a temperature which is at least 10° C. higher than the Tg (glass-rubber transition temperature) of the polymer, there being introduced into the reaction mixture, before the polymerization begins, a steric stabilizer precursor which is the acrylic or methacrylic ester of a polyethylene glycol, or a monoalkyl ether thereof, of molecular weight in the range 1500 to 4000, the concentration of free monomer in the polymerization mixture being maintained throughout at a level such that at no time does the free monomer form a separate phase.

4. A composition as claimed in claim 1, wherein the second, water-miscible constituent of the aqueous medium is ethanol.

4,562,227

HEAT-HARDENABLE REACTION RESIN MIXTURES COMPRISING POLYFUNCTIONAL EPOXIDE, POLYISOCYANATE PREPOLYMER AND A REACTION ACCELERATOR WHICH IS EITHER A TERTIARY AMINE OR AN IMIDAZOLE

Wolfgang Rogler, Erlangen; Helmut Markert, Nuremberg; Klaus Kretzschmar, Erlangen, and Gerhard Piecha, Nuremberg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jun. 27, 1984, Ser. No. 624,982

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1983, 3323123

Int. Cl.[4] C08G *18/38*

U.S. Cl. 524—786 15 Claims

1. A heat-hardenable reaction resin mixture comprising:

(a) a polyfunctional epoxide;

(b) a polyfunctional isocyanate; and

(c) a reaction accelerator selected from a tertiary amine or an imidazole, wherein;

the polyfunctional isocyanate comprises an isocyanate prepolymerisate in the form of a reaction product of diphenylmethanediisocyanate and a diol or of a reaction product of a diol and an isocyanate mixture of diphenylmethanediisocyanate and a polymethylene polyphenylisocyanate having at least 2 isocyanate groups per molecule of monomer unit; the equivalent ratio of isocyanate to diol is from about 1:0.01 to about 1:0.35; and the equivalent ratio of epoxy to isocyanate to epoxy is from about 1:0.2 to 1:5.

4,562,228

POLYMER BLENDS

Augustin T. Chen, Cheshire; Kemal Onder, North Haven, and Karl W. Rausch, Jr., Hamden, all of Conn., assignors to The UpJohn Company, Midland, Mich.

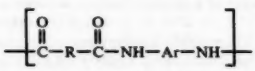
Continuation of Ser. No. 584,842, Feb. 29, 1984, abandoned. This application Apr. 29, 1985, Ser. No. 727,200

Int. Cl.[4] C08L *75/00;* C08F *8/30*

U.S. Cl. 525—66 8 Claims

1. A polymer blend which comprises:

(1) a polyamide characterized by a recurring unit of the formula



(I)

wherein Ar represents arylene and, in about 30 to about 85 percent of the recurring units, R represents alkylene from 6 to 12 carbon atoms, inclusive, in 0 to about 70 percent of the recurring units R represents m-phenylene, and in 0 to about 50 percent of said recurring units R represents tetramethylene; and

(2) an impact resistance-enhancing amount of an acrylic multiphase composite interpolymer consisting of a first elastomer phase polymerized from a major proportion of a C_1 to C_6 alkyl acrylate with up to 5 percent by weight of a crosslinking monomer which is an ester of acrylic or methacrylic acid and up to 5 percent by weight of a graft-linking monomer which is an allyl ester of an acid selected from the group consisting of acrylic, methacrylic, maleic, and fumaric acids, and, grafted on to said first elastomeric phase a rigid acrylate or methacrylate-based thermoplastic phase free of epoxy groups which thermoplastic phase has been polymerized in the presence of the first elastomeric phase.

4,562,229

BLENDS OF POLYOLEFIN GRAFT POLYMERS AND SMA POLYMERS

Leigh E. Walker, Lewiston, and Gautam R. Ranade, Grand Island, both of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Oct. 12, 1983, Ser. No. 541,398

Int. Cl.[4] C08L *51/06, 51/04, 27/06*

U.S. Cl. 525—71 14 Claims

1. A polymer composition comprising:

a copolymer of a monovinyl aromatic compound and an anhydride of an ethylenically unsaturated dicarboxylic acid, and

a vinyl halide polyolefin graft polymer wherein the vinyl halide alone or in combination with up to 50 percent by weight based on the total weight of monomer of an ethylenically unsaturated compound copolymerizable therewith, and in the liquid state, is polymerized with a polyolefin which comprises a polymer of an aliphatic hydrocarbon monoolefin of 2 to about 8 carbon atoms, and which is in the solid state and is substantially insoluble in the monomer but absorbs a substantial amount of the monomer wherein the proportion of polyolefin in said graft polymer is greater than about 20 up to 80 weight precent based on the weight of the monomer.

4,562,230

MODIFIED POLYOLEFIN COMPOSITION AND PROCESS FOR PRODUCING THE SAME

Osamu Fukui, Toyonaka; Yoshihiro Inuizawa, Sakai; Saburo Hinenoya, Izumisano, and Yasufumi Takasaki, Sakai, all of Japan, assignors to UBE Industries, Ltd., Yamaguchi, Japan

Continuation-in-part of Ser. No. 466,861, Feb. 16, 1983, abandoned. This application Nov. 10, 1983, Ser. No. 550,764

Claims priority, application Japan, Mar. 1, 1982, 57-30631

Int. Cl.[4] C08L *51/06, 23/16, 23/26*

U.S. Cl. 525—74 8 Claims

1. A modified polyolefin composition, consisting essentially of (A) a modified olefin polymer material which is a reaction product of 100 parts by weight of at least one crystalline ethylene-propylene random copolymer containing from 0.5% to 5% by weight of copolymerized ethylene and having a melt flow index of from 0.2 to 5, with from 0.02 to 0.3 parts by weight of a modifying agent consisting of at least one unsaturated dicarboxylic anhydride in the presence of from 0.01 to 0.2 parts by weight of a radical reaction initiator at a temperature of from 170° C. to 270° C. at which the reaction mixture is molten; and (B) an ethylene-propylene copolymer rubber in an amount of from 35% to 40% based on the sum of the weight of said modified olefin polymer material and said ethylene-propylene copolymer rubber, which copolymer rubber material has been mixed with said modified olefin polymer material at a temperature at which the resultant mixture is molten, said composition having a melt flow index of from 1 to 20 g/10 min determined in accordance with ASTM D 1238 at a temperature of 230° C., and a brittleness temperature not higher than −20° C.

4,562,231

POLYETHER SULFONE RESIN CONTAINING MOLDING COMPOSITION AND METHOD

Barry D. Dean, Broomall, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Sep. 6, 1984, Ser. No. 647,776

Int. Cl.[4] C08L *81/06, 33/24*

U.S. Cl. 525—189 15 Claims

1. A moldable polymer composition comprising from about 99 to about 1% by weight of a polyether sulfone resin and from about 1 to about 99% by weight of a copolymer containing from about 50 to about 60 mole % recurring units of a vinyl aromatic monomer and from about 40 to about 50 mole % recurring units of a maleimide monomer, said copolymer having a peak molecular weight within the range of from about 50,000 to about 500,000.

4,562,232

COPOLYETHERESTER-DIMER ESTER-BLOCK COPOLYMERS

Gary F. Smith, Pittsfield, Mass., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 24, 1984, Ser. No. 685,378

Int. Cl.[4] C08G *63/76*

U.S. Cl. 525—444.5 20 Claims

1. A thermoplastic elastomeric block copolyether ester comprising the reaction product of

(a) at least one C_2 to C_{20} diol,

(b) at least one C_6 to C_{20} aromatic dicarboxylic acid,

(c) at least one poly(alkylene ether)glycol having a molecular weight of from about 350 to about 12000 and

(d) a property improving amount of a dimer ester polymer sufficient to improve compression set.

4,562,233

PROCESS FOR PREPARING LIGHT COLORED PETROLEUM RESINS AND RESINS PRODUCED THEREBY

Augustus B. Small; Vincent L. Hughes, and Francisco M. Benitez, all of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 483,256, May 13, 1983, abandoned. This application Jan. 14, 1985, Ser. No. 691,682

Int. Cl.[4] C08F *2/00, 10/100*

U.S. Cl. 526—76 2 Claims

1. An aliphatic petroleum resin of light color possessing the combined essential properties of: a softening point as determined by ASTM Procedure E-28 of from 85° C. to 100° C.; a color, Gardner of 4 or less when measured on a solution of equal weights of said resin and toluene; and, a cloud point of less than 100° C. said cloud point being measured by the temperature at which haze occurs in a cooling mixture of 20 weight parts of 60° C. melt point paraffin wax, 40 weight parts of ethylene vinyl acetate copolymer and 40 weight parts of said hydrocarbon resin; and, being obtained from the aluminum halide-catalyzed polymerization of a heat soaked, steam cracked aliphatic naphtha feed having a boiling range of 38° C. to 70° C. and a cyclodiene content of less than at least 0.5 weight percent.

4,562,234

PROCESS FOR PREPARING CROSS-LINKED ACRYLIC ELASTOMERS

Siegmund Besecke, Darmstadt, and Günter Schröder, Ober Ramstadt, both of Fed. Rep. of Germany, assignors to Röhm GmbH Chemische Fabrik, Darmstadt, Fed. Rep. of Germany

Filed Apr. 8, 1982, Ser. No. 366,670

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1981, 3114266

Int. Cl.[4] C08F *220/06*

U.S. Cl. 526—241 17 Claims

8. A pulverulent ionically crosslinked acrylic elastomer, which can be compressed to a homogeneous and essentially clear elastic material by pressing at 20° to 250° C., prepared by a process comprising:

(i) preparing a solution of a mixture of monomers comprising:

(A) a mixture of a chloride, carbonate, organocarboxylate, acetylacetonate or alcoholate zirconium compound and at least one acid selected from the group consisting of acrylic acid, and methacrylic acid, said compound and said at least one acid being present in amounts such that a zirconium salt product is formed upon heating wherein more than half of the valences of said zirconium are bound to the anion formed from said unsaturated carboxylic acid; and

(B) at least one alkyl ester of acrylic acid having 1 to 20 carbon atoms in the alkyl group or an alkyl ester of methacrylic acid having 5 to 20 carbon atoms in the alkyl group, in a substantially anhydrous organic solvent selected from the group consisting of aliphatic hydrocarbons, aromatic hydrocarbons and alcohols which does not dissolve or swell said crosslinked acrylic elastomer, the proportion of the zirconium ion of said salt in said monomer mixture being 0.1 to 15% by wt. of the monomer mixture and the proportion of component B being chosen so that the glass transistion temperature of said elastomer is less than 30 C;

(ii) polymerizing said monomer mixture by a free radical process with heat to form a pulverulent polymer; and

(iii) precipitating and separating said pulverulent polymer.

4,562,235

HYDROXYL-TERMINATED POLYMERS

John M. Zimmerman, Des Plaines; John J. Krajewski, Wheeling, and Gerry K. Noren, Hoffman Estates, all of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Apr. 18, 1984, Ser. No. 601,439
Int. Cl.[4] C08F 20/18
U.S. Cl. 526—304 13 Claims

1. A linear polymer or copolymer consisting essentially of polymerized monoethylenically unsaturated monomers including at least 30% of acrylate or methacrylate monomers and having a weight average molecular weight from about 1,500 to about 15,000, most of the polymer ends of said polymer being terminated with hydroxyl groups, one at each end of the polymer molecule, said hydroxyl groups being provided by a chain-terminating agent which is a bis hydroxyorganic xanthogen disulfide, said polymer having an average of from about 1.6 to 5 hydroxyl groups per polymer molecule.

4,562,236

REACTION PRODUCT OF LIGNOSULFONATE AND UNSATURATED FATTY AMINE

Stephen Y. Lin, Wausau, Wis., assignor to Reed Lignin Inc., Rothschild, Wis.

Filed Dec. 14, 1984, Ser. No. 681,915
Int. Cl.[4] C07G 1/00; C08H 5/02
U.S. Cl. 527—400 9 Claims

1. As a composition of matter, a reaction product of lignosulfonate containing about 2 to 8 percent by weight of combined organic sulfur, and about 0.05 to 2.0 millimoles, per gram of the lignosulfonate, of an unsaturated fatty amine of 18 to 20 carbon atoms, and 0.5 to 2.5 millimoles, per gram of the lignosulfonate, of an aldehyde.

4,562,237

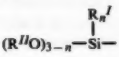
ONE COMPONENT ROOM TEMPERATURE CURABLE SEALANT COMPOSITION

Eiichi Okuno, Nogimachi; Naomi Okamura, Sohwanmachi, and Takashi Saitoh, Tokyo, all of Japan, assignors to Cemedine Co., Ltd., Tokyo, Japan

Filed Jul. 20, 1983, Ser. No. 515,548
Claims priority, application Japan, Aug. 2, 1982, 57-133796
Int. Cl.[4] C08G 77/18
U.S. Cl. 528—17 9 Claims

1. A one component room temperature curable sealant composition comprising:

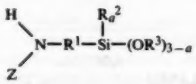
(A) a polyether polymer having at its terminal a hydrolyzable silicon functional group represented by the formula:



wherein R^I is a monovalent hydrocarbon group having from 1 to 12 carbon atoms, R^{II} is a monovalent hydrocarbon group having from 1 to 6 carbon atoms, and n is an integer of 0 to 2;

(B) a partial addition condensation product of:

(a) an aminoalkylalkoxysilane represented by the formula:



wherein R^1 is a divalent hydrocarbon group having from 1 to 4 carbon atoms, each of R^2 and R^3 is a monovalent hydrocarbon group having from 1 to 4 carbon atoms, Z is a hydrogen atom or an aminoalkyl group, and a is an integer of 0 or 1, with

(b) an epoxy compound containing at least one epoxy group in its molecular structure and having a molecular weight of from 100 to 1,000 and an epoxy equivalent of from 100 to 500, wherein 0.3–1.0 equivalents of epoxy are used per equivalent of aminoalkylalkoxysilane,

(c) a compound selected from the group consisting of γ-glycidoxypropyltrimethoxysilane, γ-glycidoxypropylmethyldiethoxysilane, 3,4-epoxycyclohexylethyltrimethoxysilane, γ-methacryloxypropyltrimethoxysilane γ-methacryloxypropylmethyldimethoxysilane,

(d) an alkoxysilane selected from the group consisting of vinyltrimethoxysilane, vinyltriethoxysilane, γ-mercaptopropyltrimethoxysilane, γ-chloropropyltrimethoxysilane, vinyl tris (β-methoxyethoxy) silane, dimethyl dimethoxysilane, methyltrimethoxysilane, tetramethoxysilane, dimethyldimethoxysilane, methyltriethoxysilane, tetraethoxysilane, diphenyldimethoxysilane, and phenyltrimethoxysilane; and

(e) an organic titanic acid ester; or a mixture thereof, and

(C) a condensation catalyst of a silanol compound.

4,562,238

ROOM TEMPERATURE CURABLE SILICONE RUBBER COMPOSITION

Kiyohiro Kondo; Hiroshi Sugawara, and Nobuyuki Hasebe, all of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jun. 18, 1984, Ser. No. 621,441
Int. Cl.[4] C08G 77/06
U.S. Cl. 528—18 5 Claims

1. A room temperature-curable silicone rubber composition which comprises:

(a) 100 parts by weight of a diorganopolysiloxane of a substantially linear molecular structure terminated at both molecular chain ends each with a hydroxy group directly bonded to the silicon atom and having a viscosity in the range from 500 to 1,000,000 centistokes at 25° C.;

(b) from 1 to 30 parts by weight of an organosilicon compound having at least three alkoxy groups directly bonded to the silicon atom or atoms;

(c) up to 300 parts by weight of an inorganic filler having a surface property not excessively acidic or alkaline; and

(d) an organotin compound represented by the general formula

$$R_2R^1Sn—O—SnR^1R_2 \text{ or } R_2SnR^1_2,$$

in which R is a monovalent hydrocarbon group and R^1 is an acid residue of a monoalkyl ester of a dibasic carboxylic acid, in an amount from 0.01 to 5% by weight based on the total amount of the components (a), (b), and (c).

4,562,239

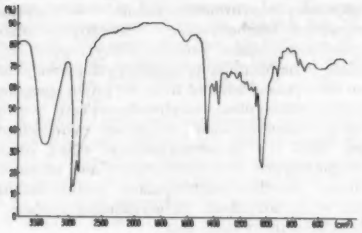
URETHANE POLYMERS CONTAINING A TERTIARY NITROGEN ATOM, AND THEIR PRODUCTION

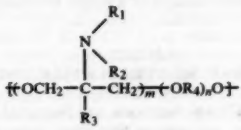
Noriomi Yamane, Kyoto; Yoshikazu Arimatsu, Otsu; Kenichi Katsuo, Otsu; Minoru Saitoh, Otsu; Katsya Tani, Shiga; Hideyuki Mitamura, and Kamatani Hiroyoshi, both of Otsu, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 405,641, Aug. 5, 1982, Pat. No. 4,480,705. This application Aug. 6, 1984, Ser. No. 638,007
Claims priority, application Japan, Aug. 5, 1981, 56-122774; Sep. 10, 1981, 56-143568
Int. Cl.[4] C08G 18/32, 18/38
U.S. Cl. 528—65 4 Claims

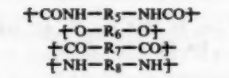
1. A tertiary nitrogen atom-containing urethane polymer which comprises units of the following formulas (I) and (II) as the essential components and units of the following formulas (III), (IV) and (V) as optional components, the content of the unit of the formula (I) being not less than 10 milliequivalents in terms of the tertiary nitrogen atom per kilogram of the ure-

thane polymer, and has a molecular weight of not less than 500:





(I)



(II)
(III)
(IV)
(V)

wherein R_1 and R_2 are each a C_1–C_4 alkyl group, R_3 is a C_1–C_4 alkyl group, R_4 is an optionally branched C_1–C_8 alkylene group, m is a positive integer and n is zero or a positive integer but m+n is a number which can provide the unit of the formula (I) with a molecular weight of 131 to 6,998 and the bondings in the unit of the formula (I) may be in random or block, R_5 is a residue of an organic diisocyanate, R_6 is an optionally branched C_1–C_8 alkylene group, an aromatic group optionally substituted with one or more C_1–C_4 alkyl groups and/or one or more halogen atoms or a residue of a polyetherdiol thereof, R_7 is a residue of a dicarboxylic acid and R_8 is a residue of a diamine or a residue of a hydrazine.

4,562,240

BICYCLIC AMIDE ACETAL/POLYOL/POLYISOCYANATE POLYMERS

Anil B. Goel, Worthington, and Timothy A. Tufts, Columbus, both of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Dec. 20, 1984, Ser. No. 684,187
Int. Cl.[4] C08G *18/38*
U.S. Cl. 528—73 **14 Claims**

1. The process for preparing a polymer having high impact strength comprising interpolymerizing a mixture of a bicyclic amide acetal, a polyol and a polyisocyanate wherein the weight ratio of bicyclic amide acetal to polyol is in the range of from about 99:1 to 0.1:99.9 and the equivalent ratio of polyisocyanate to combined polyol and bicyclic amide acetal is in the range of from about 0.8:1 to about 3:1.

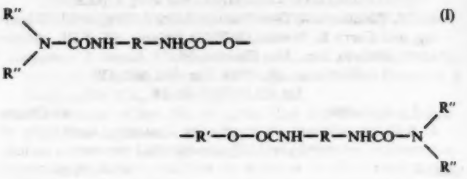
4,562,241

DIURETHANE DIUREAS AND THE USE THEREOF

Alfred Renner, Muntelier, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 4, 1984, Ser. No. 657,869
Int. Cl.[4] C08G *59/44, 59/46, 59/48*
U.S. Cl. 528—99 **10 Claims**

1. A diurethane diurea of the formula I



(I)

wherein

R is in each case a radical derived from a diisocyanate and having at most 20 C atoms,

R′ is a radical derived from a diol and having a molecular weight of at most 1500, and the radicals

R″ are each methyl or ethyl, or both radicals R″ bound to the same N atom form together with the N atom the piperidino, morpholino or pyrrolidino radical.

5. A hot-curable mixture which contains

(a) an epoxide resin and

(b) an effective amount of a diurethane diurea of the formula I according to claim 1.

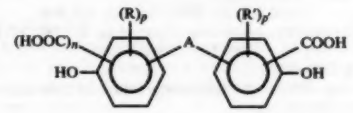
4,562,242

BRANCHED POLYCARBONATE FROM CARBOXY CONTAINING DIPHENOL

Victor Mark, Evansville, and Charles V. Hedges, Mt. Vernon, both of Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 24, 1984, Ser. No. 685,907
Int. Cl.[4] C08G *63/62*
U.S. Cl. 528—193 **26 Claims**

1. A high molecular weight, thermoplastic, randomly branched polycarbonate of an aromatic dihydric phenol, a carbonate precursor and a chain branching agent comprising at least one compound selected from the formula



where

A is selected from alkylene radicals from 1 to 6 carbon atoms, alkylidene radicals from 1 to 6 carbon atoms, cycloalkylene radicals or cycloalkylidene radicals containing from 4 to 6 carbon atoms;

R and R′ are independently selected from halogen radicals, monovalent hydrocarbon radicals of from 1 to 4 carbon atoms, or monovalent hydrocarbonoxy radicals of from 1 to 4 carbon atoms;

n is an integer having a value of 0 or 1;

p and p′ independently are integers having a value of 0 or 1; and

said randomly branched polycarbonate has an intrinsic viscosity of about 0.3 to about 2.0 dl/g in methylene chloride at 25° C.

4,562,243

CROSSLINKABLE DIFUNCTIONALIZED POLYARYLENE POLYETHERS

Virgil Percec, Shaker Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Mar. 6, 1984, Ser. No. 586,678
Int. Cl.[4] C08G *65/48, 75/23*
U.S. Cl. 528—174 **4 Claims**

1. A difunctionalized substantially linear crosslinkable ther-

moplastic polyarylene polyether oligomer, or polyarylene polythioether oligomer represented by the formula:

$$R^e—R—[\text{"PAPE"}]—R—R^e$$

wherein,

R represents O or S in an ether or ester linkage with R^e;

R^e represents a residuum containing a terminal carbon to carbon double bond at each end of the oligomer; and,

"PAPE" represents the residuum of the polyarylene polyether, or polyarylene polythioether oligomer.

4,562,244

PROCESS FOR FORMING THERMALLY STABLE THERMOTROPIC LIQUID CRYSTALLINE POLYESTERS OF PREDETERMINED CHAIN LENGTH UTILIZING ALIPHATIC DICARBOXYLIC ACID

Hyun-Nam Yoon, Summit, N.J., assignor to Celanese Corporation, New York, N.Y.

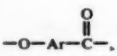
Filed Mar. 29, 1984, Ser. No. 595,004

Int. Cl.[4] C08G *63/06, 63/16, 63/60, 69/44*

U.S. Cl. 528—190 **30 Claims**

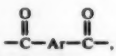
1. In a process for the formation within a polymerization zone of a polyester which is capable of forming an anisotropic melt phase and which optionally may include amide linkages through a polymerization reaction of ester-forming and optionally also amide-forming monomers to form a polymer having recurring moieties selected from the group consisting of the following where in each instance Ar comprises at least one aromatic ring:

(a)



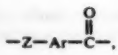
(b) —O—Ar—O—,

(c)



(d) —Y—Ar—Z—, where Y is O, NH, or NR, and Z is NH or NR where R is an alkyl group of 1 to 6 carbon atoms or an aryl group,

(e)



where Z is NH or NR where R is an alkyl group of 1 to 6 carbon atoms or an aryl group, and

(f) fixtures of the foregoing;

the improvement of providing in the polymerization zone during said polymerization reaction an approximately 0.25 to 4 percent molar excess of aliphatic dicarboxylic acid monomer containing 4 to 12 carbon atoms and/or an esterified derivative thereof which during the polymerization reaction imparts dicarboxyaliphatic units to the interior of the polymer chains of the resulting polymer and causes the polymer chains to terminate in carboxylic acid end groups and/or an esterified derivative thereof wherein the polymer chains achieve a predetermined average chain length through the depletion of other monomers present in the polymerization zone to yield a polyester product which is substantially incapable of additional chain growth upon subsequent heating.

4,562,245

EXTRACTION PROCESS

John F. Stageman, County Durham, England, assignor to Imperial Chemical Industries PLC, Great Britain

Filed Apr. 16, 1984, Ser. No. 600,384

Claims priority, application United Kingdom, Apr. 28, 1983, 8311677

Int. Cl.[4] C08G *63/06*

U.S. Cl. 528—361 **13 Claims**

1. A continuous, or cyclic batch, process for the extraction of a 3-hydroxybutyrate (HB) polymer from dried, solvent-permeable HB-polymer containing microorganism cells, said process comprising:

(a) contacting said cells with an extraction liquid to form a syrup containing HB-polymer dissolved in the extraction liquid, said extraction liquid consisting of a mixture of

(i) a solvent for said HB-polymer selected from dichloromethane, chloroform, and 1,2-dichloroethane, and

(ii) a non-solvent for said HB polymer selected from methanol and ethanol, with the proviso that the non-solvent is methanol when said solvent is 1,2-dichloroethane,

said extraction liquid containing sufficient of said solvent that said extraction liquid dissolves said polymer under the extraction conditions,

(b) separating said syrup from the undissolved cell residue,

(c) treating said syrup by adding thereto a sufficient quantity of a liquid composition, that is miscible with said syrup so that said syrup is converted to a composition that can be mechanically separated into a solid polymer phase and a liquid phase, and effecting said mechanical separation, said liquid composition

A. consisting of

(iii) said non-solvent, or a mixture of said non-solvent and said solvent, and optionally

(iv) water,

the amount, if any, of water in said liquid composition being such that said separated liquid phase contains less than 20% by weight of water, and

B. having a lower content of said solvent than said extraction liquid,

(d) distilling at least a proportion of said separated liquid phase to recover therefrom the azeotrope formed between said solvent and said non-solvent to leave a residue that is richer in non-solvent than said liquid phase, and

(e) recycling at least a proportion of said recovered azeotrope to the syrup forming stage, the proportion of said liquid phase that is subjected to distillation and of said azeotrope that is recycled being such that at least 80% by weight of said extraction liquid consists of said recycled azeotrope.

4,562,246

ESSENTIALLY LINEAR, THERMOPLASTIC POLY (AMINO-S-TRIAZINES)S AND PROCESS FOR THE PRODUCTION THEREOF

David W. Wang, Trumbull; Michael M. Fisher, Ridgefield, and Walter M. Thomas, Darien, all of Conn., assignors to American Cyanamid Company, Me.

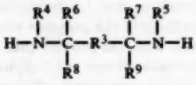
Division of Ser. No. 366,748, Apr. 8, 1982, abandoned. This application Mar. 16, 1984, Ser. No. 589,859

Int. Cl.[4] C08G *73/06*

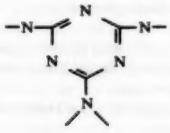
U.S. Cl. 528—423 **24 Claims**

1. A process for the production of high molecular weight essentially linear, thermoplastic amino-s-triazine resin which comprises reacting in contact with water, an inert, water-immiscible organic solvent for at least one of dihalo-s-triazine and diamine and a basic acid acceptor, substantially equimolar proportions of a triazine compound or a mixture of triazine compounds of the formula:

wherein each X is fluorine, chlorine, bromine or iodine, and R^1 and R^2 are independently hydrogen, linear or branched chain C_1–C_6 alkyl, cycloalkyl of 3–6 carbon atoms, or aryl, or said cycloalkyl or aryl groups substituted with C_1–C_4 alkyl groups, with a diamine, or a mixture of diamines of the formula:



wherein R^4 and R^5 are independently hydrogen or C_1–C_4 alkyl; R^6 through R^9 inclusive are independently C_1–C_4 alkyl; and R^3 is C_1–C_{30} cyclic or linear alkylene, or C_1–C_{30} cyclic or linear alkylene interrupted with —O—, —S—, or Si, —(CH_2)—$_n$ where n is 0 to 12, C_6–C_{12} arylene, or C_1–C_{12} alkylidene, until a thermoplastic amino-s-triazine resin having an inherent viscosity of at least about 0.55 dl./g., measured at 30° C. on a 0.5% by weight solution in 88% aqueous formic acid, is produced, said resin containing not less than 25 wt. % of triamino-s-triazine units of the formula:



4,562,247

DISAZO COMPOUNDS CONTAINING A 6-ACETOACETAMIDE-1-NAPHTHOL-3-SULFONIC DERIVATIVE AS COUPLING COMPONENT

Visvanathan Ramanathan, Basel, Switzerland, assignor to Ciba Geigy Corporation, Ardsley, N.Y.

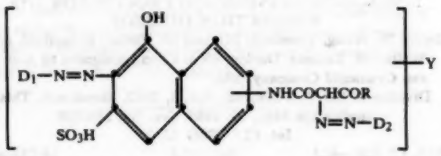
Filed May 29, 1984, Ser. No. 614,909

Claims priority, application Switzerland, Jun. 7, 1983, 3110/83

Int. Cl.[4] C09B *31/10, 33/28, 43/00, 44/02*

U.S. Cl. 534—605 **6 Claims**

1. An azo compound of the formula



wherein

D_1 and D_2 independently of one another are each the radical of a diazo component,

R is C_1–C_4-alkyl or C_1–C_4 alkyl substituted by C_1–C_4-alkoxy or halogen or is phenyl or phenyl substituted by C_1–C_4-alkyl, halogen or C_1–C_4 alkoxy, and

Y is a basic or cationic group, with the proviso that the number of basic or cationic Y groups is equal to or greater than the number of SO_3H groups.

4,562,248

AZO DYES FROM UNSUBSTITUTED OR SUBSTITUTED 3-AMINO-PYRIDINE AND ARYL OR HETEROCYCLIC COUPLERS

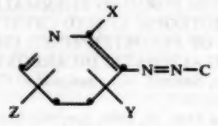
Max A. Weaver, and Jean C. Fleischer, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 25, 1983, Ser. No. 554,866

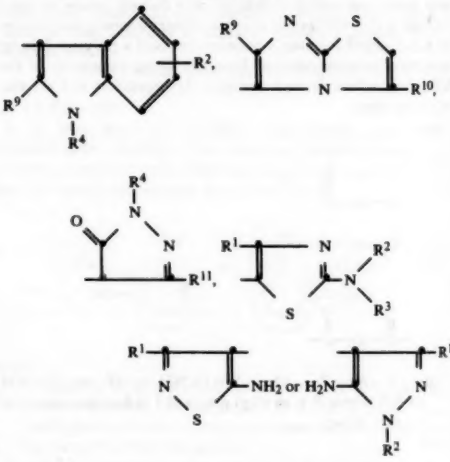
Int. Cl.[4] C09B *29/036, 29/36, 29/42, 29/46*

U.S. Cl. 534—630 **12 Claims**

1. A dye of the formula



wherein X, Y, and Z are independently selected from hydrogen, halogen and cyano, and C is a coupler of the formula



wherein R^1, R^2, R^3, R^{10}, and R^{11} are independently selected from hydrogen and alkyl, and R^4 and R^9 are each selected from hydrogen and phenyl.

4,562,249

BIS(4-((CHLORO SUBSTITUTED PHENYL)AZO)ANILINO METHYLENES

Hansrudolf Schwander, Riehen, and Rudolf Hurter, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

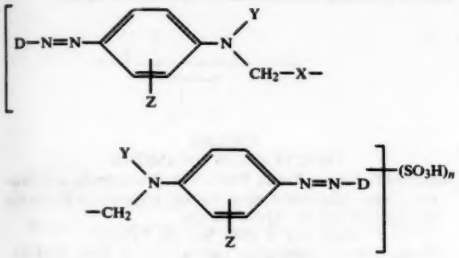
Continuation of Ser. No. 582,160, Feb. 27, 1984, abandoned, which is a continuation of Ser. No. 247,422, Mar. 25, 1981, abandoned. This application Mar. 5, 1985, Ser. No. 707,548

Claims priority, application Switzerland, Mar. 31, 1980, 2538/80

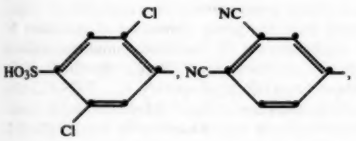
Int. Cl.[4] C09B *33/02, 33/06, 33/12, 33/16*

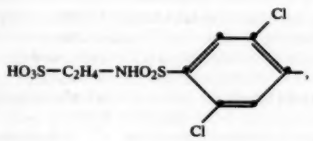
U.S. Cl. 534—641 **13 Claims**

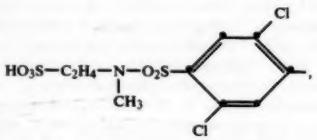
1. A disazo compound of the formula

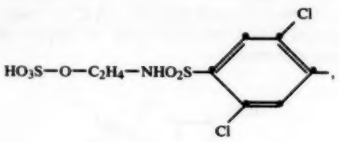


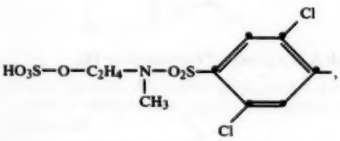
wherein each D independently of the other is

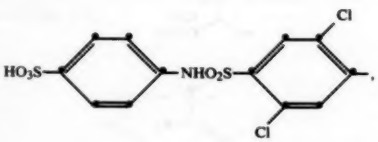


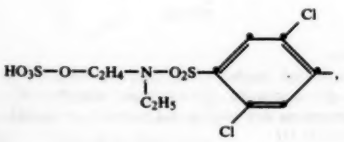




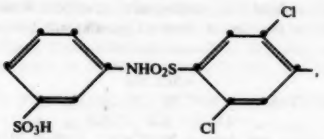


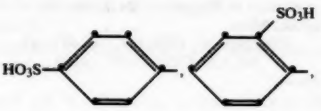


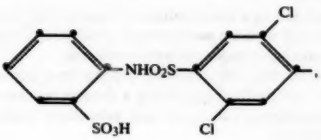


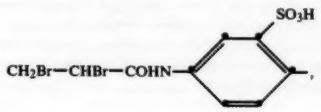


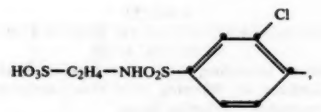
-continued

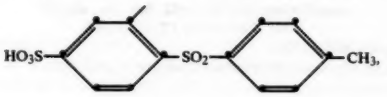


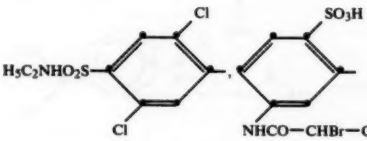


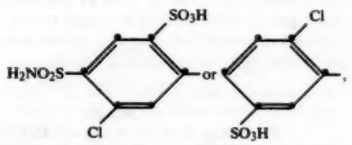












each Z independently of the other is hydrogen or a C_{1-4}-alkyl group or an acylamino group, Y is hydrogen or an unsubstituted or substituted C_{1-6}-alkyl group, X is a direct bond, C_{1-6}-alkylene, —CH=CH—, —CH_2—O—CH_2—,

and n is a number from 2 to 6, and the substituent Y, in the case

of an unsubstituted or substituted C_{1-6}-alkyl group, can be bonded to the o-position relative to the N atom of the phenylene group to form a six-membered ring, or both Y substituents can be linked together to form a C_{1-6}-alkylene bridge.

4,562,250

STEROIDAL GLYCOSIDES PRODUCED BY YUCCA TISSUE CULTURE

E. John Staba, and Jean J. MacCarthy, both of Minneapolis, Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Sep. 13, 1982, Ser. No. 417,419
Int. Cl.⁴ C07J *17/00, 19/00*
U.S. Cl. 536—6 **2 Claims**

1. Radio-labeled steroidal glycosides of the Yucca plant produced by:

(A) establishing a tissue culture of Yucca plant on a nutrient plant cell medium containing a growth regulator,

(B) maintaining under growth conditions,

(C) transferring the resulting culture to a liquid nutrient plant cell medium containing a growth regulator,

(D) maintaining the liquid and subculture under growth conditions,

(E) incubating the liquid subculture toward the end of its growth cycle with a radioactive isotope, and

(F) harvesting the Yucca plant tissue cultures from the medium and extracting the resulting radio-labeled steroidal glycosides therefrom.

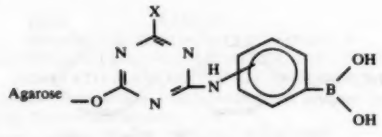
4,562,251

AGAROSE DERIVATIVES OF AMINO PHENYL BORONIC ACID

Scott Fulton, Brookline; Basil Yankopoulos, Peabody, and Lewis Zediana, Jr., Billerica, all of Mass., assignors to Amicon Corporation, Lexington, Mass.

Continuation-in-part of Ser. No. 247,989, Mar. 26, 1981. This application Jul. 26, 1982, Ser. No. 402,023
Int. Cl.⁴ C07H *17/02, 23/00*
U.S. Cl. 536—17.4 **10 Claims**

1. Compounds having the structure



wherein X is Cl, —OR, or —NRR$_1$ wherein each R and R$_1$ is hydrogen, or alkyl, alkenyl, or aralkyl having up to 8 carbons, cycloalkyl, or aryl having up to 6 carbon atoms or cyanoalkyl or hydroxyalkyl having up to 3 carbons.

4,562,252

PROCESS FOR ISOLATING MICROBIAL POLYSACCHARIDES FROM THEIR AMINE ADDUCTS

Edgar Fischer, Frankfurt am Main, and Merten Schlingmann, Königstein, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 12, 1983, Ser. No. 522,611
Claims priority, application Fed. Rep. of Germany, Aug. 14, 1982, 3230302
Int. Cl.⁴ C07H *1/06;* **C08B** *37/00*
U.S. Cl. 536—114 **10 Claims**

1. In a process for cleaving amine adducts of polysaccharides and for isolating the free microbial polysaccharides from said amine adducts by treating said adducts with alkaline agents in the presence of monohydric alkanols having 1 to 3 carbon atoms, the improvement comprising using ammonia or a highly volatile amine capable of cleaving said free polysaccharide from said amine adduct as the alkaline agent.

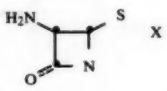
4,562,253

DEACYLATION OF AMIDES

Bernhard C. Prager, Kundl; Peter Punk, Breitenbach, and Heinrich Thaler, Kirchbichl, all of Austria, assignors to Biochemie Gesellschaft m.b.H., Tyrol, Austria

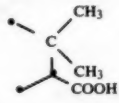
Filed Aug. 3, 1983, Ser. No. 519,830
Claims priority, application Austria, Aug. 6, 1982, 3024/82
Int. Cl.⁴ C07D *499/04, 501/04*
U.S. Cl. 544—19 **11 Claims**

1. In an iminohalide/iminoether reaction for converting amido groups to amino groups present on a penicillin or cephalosporin selected from the group consisting of penicillin V, penicillin G, cephalosporin C, 6-chloracetamidopenicillanic acid, N-[2,2-diethoxycarbonylvinyl(1)]cephalosporin C, N-[2-nitro-2-carbethoxyvinyl(1)]cephalosporin C, 7-[N-(2,2-diethoxycarbonyl)vinyl]adipinoylamino-3-[(1-methyl-1,2,3,4-tetrazol-5-yl)thiomethyl]ceph-3-em-4-carboxylic acid, 7-[N-(2,2-diethoxycarbonyl)vinyl]adipinamido-3-[(2,5-dihydro-6-hydroxy-5-oxo-2-methyl-1,2,4-triazin-3-yl)thiomethyl]ceph-3-em-4-carboxylic acid, 7-[N-(2,2-diethoxycarbonyl)vinyl]adipinamido-3-[(4,5-dihydro-6-hydroxy-5-oxo-4-methyl-1,2,4-triazin-3-yl)thiomethyl]ceph-3-em-4-carboxylic acid, 3-desacetoxy-3-(1-methyl-1,2,3,4-tetrazol-5-yl)thiocephalosporin C, 3-desacetoxy-3-(2,5-dihydro-6-hydroxy-5-oxo-2-methyl-1,2,4-triazin-3-yl)thiocephalosporin C, 3-desacetoxy-3-(4,5-dihydro-6-hydroxy-5-oxo-4-methyl-1,2,4-triazin-3-yl)thiocephalosporin C, 7-phenoxyacetamido-3-methylceph-3-em-4-carboxylic acid, 7-chloracetamido-3-methylceph-3-em-4-carboxylic acid, 7-phenylacetamido-3-methylceph-3-em-4-carboxylic acid, N-ethoxycarbonylcephalosporin C, N-methoxycarbonylcephalosporin C, N-isobutoxycarbonylcephalosporin C, N-iso-propyloxycarbonylcephalosporin C, N-(N'-butylcarbamoyl)cephalosporin C, N-(N'-phenylcarbamoyl)cephalosporin C, N-chloracetylcephalosporin C, or 7-benzylamino-3-methylceph-3-em-4-carboxylic acid; to prepare an amino-compound of formula I,

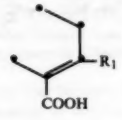


(I)

in which X is a group of formula II or IIa,



(II)

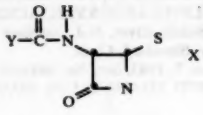


(IIa)

in which

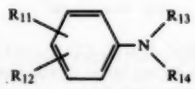
R$_1$ is methyl, methoxy, halogen, acetoxymethyl or —CH$_2$—S-heterocyclic, and esters and salts thereof,

comprising deacylating said penicillin or cephalosporin of formula III



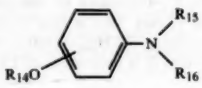
(III)

in which
X is defined above, and
Y—CO— is a carboxylic acid acyl group, or an ester or salt thereof; the improvement comprising treating said penicillin or cephalosporin with a halogenating agent in the presence of a base to form a corresponding iminohalide; wherein said base is selected from the group consisting of:
(A) long chain substituted aromatic amines of formula IX,



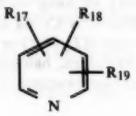
(IX)

in which R_{11} and R_{12} are the same or different and each signify hydrogen, halogen, trihalomethyl, nitro, lower alkyl or lower alkoxy; R_{13} signifies a C_{1-18} alkyl group; and R_{14} signifies a C_{8-18} alkyl group;
(B) long-chain substituted aromatic amines of formula X,



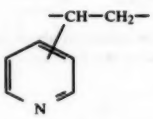
(X)

in which R_{14} is as defined above, and R_{15} and R_{16} are the same or different and signify a C_{1-14} alkyl group;
(C) long-chain substituted pyridines of formula XI



(XI)

in which R_{17} signifies a C_{6-20} alkyl group, and R_{18} and R_{19} are the same or different and signify hydrogen or a C_{1-18} alkyl group, and
(D) polymeric pyridines containing repeating units of units of formula XII,



(XII)

and after the alcoholysis and hydrolysis, essentially removing said base in free base or salt form, from the resulting aqueous mixture by extracting in a water-immiscible organic solvent, or by filtration.

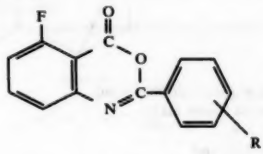
4,562,254

PREPARATION OF 5-FLUORO-2-PHENYL-4H-3,1-BENZOXAZIN-4-ONES

Jürgen Varwig, Heidelberg; Gerhard Hamprecht, Weinheim, and Wolfgang Rohr, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

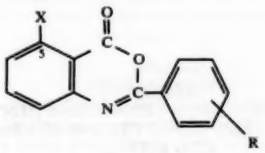
Filed Sep. 28, 1984, Ser. No. 655,726
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1983, 3335456; Mar. 6, 1984, 3408154
Int. Cl.[4] C07D *265/10*
U.S. Cl. 544—92 **18 Claims**

1. A process for the preparation of a 5-fluoro-2-phenyl-4H-3,1 benzoxazin-4-one (I)



(I)

where R is hydrogen, halogen, C_1–C_3–alkyl, or trifluoromethyl, trifluoromethoxy, chlorodifluoromethoxy, difluoromethoxy, tetrafluoroethoxy, trifluoromethylmercapto or chlorodifluoromethylmercapto in the m- or p-position which comprises reacting a corresponding 2-phenyl-4H-3,1-benzoxazin-4-one (II)



(II)

where X is chlorine, bromine, iodine, nitro, mesyl or tosyl, with an alkali metal fluoride, said reaction being carried out in the absence of water.

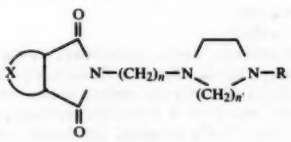
4,562,255

SUBSTITUTED BI-ALICYCLIC IMIDES

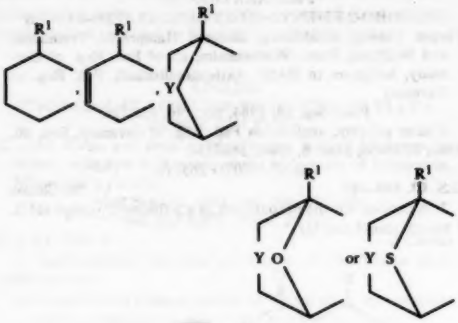
Meier E. Freed, Paoli, Pa., and Magid A. Abou-Gharbia, Wilmington, Del., assignors to American Home Products Corporation, New York, N.Y.

Filed Mar. 30, 1984, Ser. No. 595,138
Int. Cl.[4] C07D *403/14, 405/14, 409/14*
U.S. Cl. 544—357 **4 Claims**

1. A compound having the formula



wherein X is a group selected from



Y represents a single or double bond;
R^1 is hydrogen or lower alkyl;
n is an integer 2–4;
n' is an integer 1–2; and
R is [2-pyrimidinyl, 2-pyridinyl,] 2-pyrazinyl, halo-substituted 2-pyrazinyl or 5-tetrazolyl;
and the pharmacologically acceptable salts thereof.

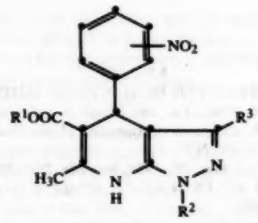
4,562,256

1,6-DIALKYL-3-SUBSTITUTED-4-NITROPHENYL-4,7-DIHYDROPYRAZOLO[3,4-B]PYRIDINE-5-CARBOXYLIC ACID ESTERS

Ikuo Adachi, Osaka; Teruo Yamamori, Hyogo; Motohiko Ueda, and Masami Doteuchi, both of Osaka, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Aug. 17, 1984, Ser. No. 641,822
Claims priority, application Japan, Sep. 8, 1983, 58-166258
Int. Cl.[4] C07D 471/04
U.S. Cl. 546—120 **5 Claims**

1. A 4,7-dihydropyrazolo[3,4-b]pyridine derivative represented by the general formula:



[wherein
R^1 is C_1–C_4 alkyl,
R^2 is C_1–C_4 alkyl,
R^3 is C_2–C_6 alkenyl, C_4–C_6 cycloalkenyl, C_4–C_6 cycloalkyl C_1–C_4 alkyl, C_1–C_4 alkoxy-C_1–C_4 alkyl, C_4–C_6 cycloalkyloxy C_1–C_4 alkyl, C_5–C_6 cycloalkyl containing oxo or protected oxo, 5 or 6 membered cycloalkylene-amino C_1–C_4 alkyl, C_1–C_4 haloalkyl, adamantyl, 1-methylpyrrolidinyl or 1,3-dithiolan-2-yl]
and the acid addition salt thereof.

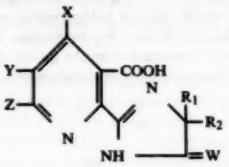
4,562,257

PREPARATION OF SUBSTITUTED AND UNSUBSTITUTED 2-CARBAMOYL NICOTINIC AND 3-QUINOLINECARBOXYLIC ACIDS

David V. Petrocine, Saddle River, N.J., assignor to American Cyanamid Company, Stamford, Conn.

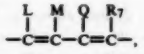
Filed Nov. 7, 1983, Ser. No. 549,045
Int. Cl.[4] C07D 213/803, 215/54, 401/04
U.S. Cl. 546—169 **9 Claims**

1. In a process for the preparation of a 2-(4,4-disubstituted-5-oxo(or thiono)-2-imidazolin-2-yl)-nicotinic acid and 3-quinolinecarboxylic acids of the formula:

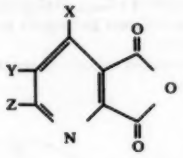


(IV)

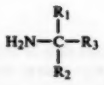
wherein R_1 is C_1–C_4 alkyl; R_2 is C_1–C_4 alkyl or C_3–C_6 cycloalkyl; and when R_1 and R_2 are taken together along with the carbon to which they are attached, they may represent C_3–C_6 cycloalkyl optionally substituted with methyl, and when R_1 and R_2 are not the same, the optical isomers thereof; W is O or S; X is hydrogen, or C_1–C_4 alkyl, Y is hydrogen, halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, trifluoromethyl, trichloromethyl, difluoromethoxy, diloweralkylamino, C_1–C_4 alkylthio, nitro, phenyl or phenoxy optionally substituted with one C_1–C_4 alkyl, C_1–C_4 alkoxy or halogen; Z is hydrogen, C_1–C_4 alkyl, trifluoromethyl, trichloromethyl, phenyl or phenyl substituted with one C_1–C_4 alkyl, C_1–C_4 alkoxy or halogen; and when taken together, Y and Z may form a ring in which YZ are represented by the structure: $—(CH_2)_n—$, where n is an integer from 3 to 5, provided that X is hydrogen; or YZ is



where L, M, Q and R_7 are each of hydrogen, halogen, C_1–C_4 haloalkyl, difluoromethoxy, diloweralkylamino, C_1–C_4 alkylthio, nitro, phenyl, phenoxy or mono-substituted phenyl or phenoxy where the substituent is C_1–C_4 alkoxy or halogen; with the proviso that only one of L, M, Q or R_7, may represent a substituent other than hydrogen, halogen, C_1–C_4 alkyl or C_1–C_4 alkoxy which comprises reacting a compound of the structure:



wherein X, Y and Z are as described above with a 1.0 to 1.5 equivalent, of a compound of the formula:

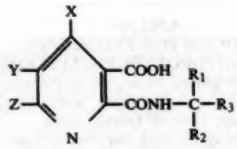


wherein R_1 and R_2 are as described above; R_3 is CN,

or

at a temperature between 5° and 45° C. under a blanket of nitrogen, to obtain 2-carbamoyl nicotinic and 3-quinolinecarboxylic acids of formula (I) having the structure;

(I)



wherein X, Y, Z, R_1, R_2 and R_3 are as described above; treating the thus-formed reaction product with 2 to 10 moles of aqueous or aqueous C_1–C_4 alcoholic sodium or potassium hydroxide; and when R_3 is CN, 2 to 5 moles of 30 to 90% aqueous hydrogen peroxide per mole of formula (I) compound, at a temperature of 25° to 110° C., acidifying the thus-formed reaction mixture to a pH between 1.5 and 4 with hydrochloric acid or sulfuric acid, and isolating the product by filtration or extraction of the acidified reaction mixture with an organic solvent and separating the solvent from the formula (IV) product, the improvement comprising carrying out the reaction for preparing the formula (I) product in the presence of a minimum of 4 molar equivalents of pyridine, 4-picoline, 2-picoline, 3-picoline, mixed picolines, quinoline, or a lutidine, either alone or in the presence of a hydrocarbon co-solvent.

4,562,258

6-[3-AMINO-1-(4-TOLYL)PROP-1E-ENYL]PYRIDINE-2-CARBOXYLIC ACID DERIVATIVES HAVING ANTIHISTAMINIC ACTIVITY

John W. A. Findlay, Rte. 2, Box 514, Chapel Hill, N.C. 27514, and Geoffrey G. Coker, 80 Pickhurst Park, Bromley, England

Filed Feb. 1, 1983, Ser. No. 462,874

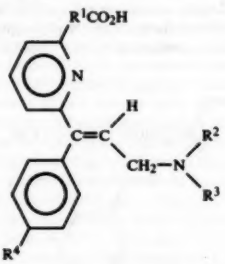
Claims priority, application United Kingdom, Feb. 4, 1982, 8203261

Int. Cl.⁴ C07D *213/55, 401/06*

U.S. Cl. 546—281 **4 Claims**

1. A compound of formula (I),

I



or a straight or branched lower alkyl (1–4 carbon atoms) ester, or a pharmaceutically acceptable salt thereof; wherein R^1 is a bond; R^2 and R^3 are the same or different and can be hydrogen, C_{1-4} alkyl or taken together with the nitrogen together with the nitrogen to which they are attached form a nitrogen containing heterocyclic ring having four to six ring members; R^4 is hydrogen, halogen, C_{1-4} alkoxy or C_{1-4} alkyl optionally substituted by one to three halogen atoms.

4,562,259

OXADIAZOLYLMETHYLTHIOL PHOSPHATES AS PESTICIDES

Hans Theobald; Heinrich Adolphi, both of Limburgerhof, and Karl Kiehs, Lampertheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 125,282, Feb. 27, 1980, abandoned. This application Jul. 6, 1981, Ser. No. 280,360

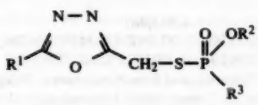
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1979, 2909013

Int. Cl.⁴ A01N *57/16, 57/24, 57/32;* **C07F** *9/65*

U.S. Cl. 548—112 **6 Claims**

1. A 1,3,4-oxadiazolylmethylthiol phosphate of the formula

I



where R^1 and R^2 are identical or different and each denotes alkyl of up to 6 carbon atoms and R^3 denotes alkylthio of up to 6 carbon atoms, amino, or alkylamino or dialkylamino where alkyl is of up to 5 carbon atoms.

6. A process for combating pests, wherein an insecticidally, acaricidally or nematocidally effective amount of a 1,3,4-oxadiazolylmethylthiol phosphate of the formula I as defined in claim 1 is allowed to act on the pests or their biotope.

4,562,260

PREPARATION OF 1,3,4-THIADIAZOLE-5-SULFONAMIDES

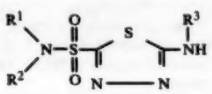
Roger L. McDaniel, Jr., Raleigh; Jeffrey W. Portzer, and Edward J. Zaiko, both of Cary, all of N.C., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jul. 3, 1984, Ser. No. 627,514

Int. Cl.⁴ C07D *285/12*

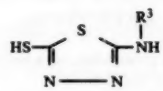
U.S. Cl. 548—141 **16 Claims**

1. An improvement in a process for the production of certain 2-amino-1,3,4-thiadiazole-5-sulfonamides of the formula:



by: (a) oxidatively chlorinating a compound of the formula I:

I



wherein R_3 is hydrogen or C_1 to C_4 alkyl, (b) sequentially reacting the product of the oxidation-chlorination step with a compound of the formula II:

II

wherein

R^1 and R^2 are individually selected from the group consist-

ing of hydrogen, alkyl, alkoxy, cycloalkyl, cyanoalkyl, alkoxyalkyl, alkenyl and alkynyl wherein the alkyl, alkenyl and alkynyl moieties contain from one to six carbon atoms; and heterocyclic structures in which R^1 and R^2 together form an alkylene or oxyalkylene chain with two to five carbon atoms, and thereafter isolating the product, the improvement comprising:

(i) performing the oxidative-chlorination step (a) by simultaneously introducing into an aqueous solution of an acid and an inorganic salt, chlorine and a compound of formula I in a molar ratio of chlorine to the said compound of formula I of from about 2 to about 5 at from about −30° C. to 30° C.; and

(ii) purging the excess chlorine from the reaction mixture prior to reaction step (b).

4,562,261

2-GUANIDINOTHIAZOLINE COMPOUNDS, AND PROCESS FOR PREPARING THEM

Yasufumi Hirata, Saitama, and Isao Yanagisawa, Tokyo, both of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

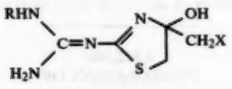
Filed Apr. 5, 1984, Ser. No. 597,234

Claims priority, application Japan, Jun. 7, 1983, 58-102206

Int. Cl.⁴ C07D *277/18*

U.S. Cl. 548—184 **4 Claims**

1. 2-Guanidinothiazoline compounds of the general formula



wherein R represents a hydrogen atom or a lower alkyl group, and X represents a halogen atom, and the acid addition salts thereof.

4,562,262

PREPARATION OF POLYCYCLIC NITROGEN-CONTAINING COMPOUNDS

Norbert Rieber, Mannheim; Heinrich Böhm, Neuhofen; Rolf Platz, Mannheim, and Werner Fuchs, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 221,539, Dec. 31, 1980, abandoned. This application Nov. 28, 1984, Ser. No. 675,467

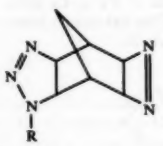
Claims priority, application Fed. Rep. of Germany, Jan. 17, 1980, 3001580

Int. Cl.⁴ C07D *487/04*

U.S. Cl. 548—257 **8 Claims**

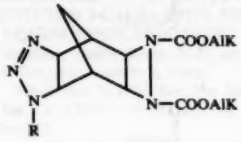
1. A process for the preparation of a polycyclic nitrogen-containing compound of the formula

(II)



wherein R is phenyl, halo-substituted phenyl and CF_3-substituted phenyl which comprises reacting a compound of the formula

(I)



where R is defined as above and Alk is a C_{1-4} alkyl with a solution of an alkali metal hydroxide or calcium hydroxide and then oxidizing the product with an aqueous solution of sodium hypochlorite or hydrogen peroxide.

4,562,263

PROCESS FOR PRODUCING 3-(3,4-DIHYDROXYPHENYL) SERINE

Naohito Ohashi, Brighton, Mass.; Shoji Nagata, and Kikuo Ishizumi, both of Toyonaka, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed May 25, 1984, Ser. No. 614,246

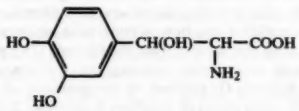
Claims priority, application Japan, May 25, 1983, 58-92941; Feb. 15, 1984, 59-27827; Feb. 15, 1984, 59-27828

Int. Cl.⁴ C07D *209/48*; C07C *99/12*

U.S. Cl. 548—479 **7 Claims**

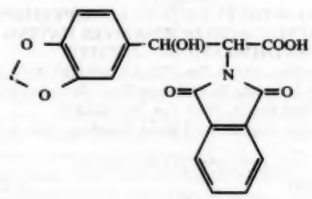
1. A process for producing 3-(3,4-dihydroxyphenyl)-serine, represented by the formula:

(I)



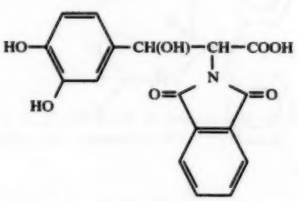
which comprises allowing the N-phthaloyl-3-(3,4-methylenedioxyphenyl)serine, represented by the formula:

(VI)



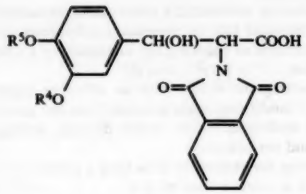
to react with a Lewis acid selected from the group consisting of aluminum trichloride, aluminum tribromide, boron trichloride, and boron tribromide to form N-phthaloyl-3-(3,4-dihydroxyphenyl)-serine, represented by the formula:

(II)



and removing the phthaloyl group with hydrazine hydrate therefrom.

7. An N-phthaloylserine derivative represented by the general formula:



wherein R^4 and R^5 each represents a hydrogen atom or a methyl group, or R^4 and R^5; jointly form a methylene group.

4,562,264

PROCESS FOR THE RECOVERY OF FIVE-MEMBERED RING DICARBOXYLIC ACID ANHYDRIDES

Fritz Gude, Herne, and Ferdinand von Praun, Haltern, both of Fed. Rep. of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Aug. 31, 1984, Ser. No. 646,073

Int. Cl.[4] C07D *307/60, 307/89*

U.S. Cl. 549—261 **6 Claims**

1. A process for the recovery of five-membered ring dicarboxylic acid anhydrides from aqueous solutions of the corresponding dicarboxylic acids which comprises:

(a) washing the aqueous solution of the dicarboxylic acid with a water-insoluble tertiary amine having a branched aliphatic side chain in the 2-position, and separating the resulting amine-acid salt from the water layer; and

(b) adding an aromatic hydrocarbon entrainer for the water, removing the entrainer/water azeotrope by distillation and separating the five-membered ring dicarboxylic acid anhydride after phase separation; or

adding an aliphatic hydrocarbon entrainer for the water, removing a ternary azeotropic mixture consisting of a hydrolytically stable anhydride, water and entrainer by distillation and separating the five-membered ring dicarboxylic acid anhydride after phase separation.

4,562,265

METHOD FOR PRODUCING A DI-ACETAL OF SORBITOL AND AN AROMATIC ALDEHYDE

Greville Machell, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Continuation-in-part of Ser. No. 83,895, Oct. 11, 1979, abandoned, which is a continuation of Ser. No. 967,024, Dec. 6, 1978, abandoned. This application Mar. 28, 1980, Ser. No. 135,017

Int. Cl.[4] C07D *323/04*

U.S. Cl. 549—364 **12 Claims**

1. A method for producing a di-acetal of sorbitol and an aromatic aldehyde which comprises: admixing an effective amount of D-sorbitol into an aqueous solution of a mineral acid so as to form a homogeneous aqueous admixture containing a catalytic amount of said mineral acid; incrementally admixing an effective amount of an aromatic aldehyde into said homogeneous aqueous admixture at a rate sufficient to allow a substantially spontaneous reaction with said D-sorbitol so as to form an aqueous slurry containing crude di-acetal product, said effective amount of aromatic aldehyde, being that amount sufficient to provide a molar ratio of D-sorbitol to aromatic aldehyde of from about 1:.75 to about 1:1.75; neutralizing the aqueous slurry admixture; separating said crude di-acetal product from the liquid phase of the neutralized aqueous slurry; washing the separated crude di-acetal product with water to remove mono-acetal impurities present in said crude di-acetal product; drying the washed di-acetal product to remove substantially all of the residual water; and recovering purified, substantially dry di-acetal product.

4,562,266

PROCESS FOR THE PREPARATION OF 2,3-DIHYDRO-2,2-DIMETHYL-7-BENZOFURANOL

Carlo Neri; William Giroldini, both of S. Donato Milanese; Mario Traversoni, Osio Sotto; Guido Guizzi, Milan; Emilio Perrotti, and Antonio Rinaldi, both of S. Donato Milanese, all of Italy, assignors to Enichimica Secondaria, S.p.A., Palermo, Italy

Filed Apr. 19, 1984, Ser. No. 602,214

Claims priority, application Italy, Apr. 22, 1983, 20738 A/83; Apr. 22, 1983, 20739 A/83

Int. Cl.[4] C07D *307/86*

U.S. Cl. 549—462 **15 Claims**

1. A process for the preparation of 2,3-dihydro-2,2-dimethyl-7-benzofuranol, comprising the steps of:

(a) contacting in a first reaction stage 4-tert. butyl catechol and isobutyraldehyde in a molar ratio from 0.3:1 to 2:1, in the presence of from 0.3 to 10 percent by weight, relative to the 4-tert.butyl catechol, of at least one catalytic compound selected from among oxides, hydroxides, alcoholates and carboxylates of metals belonging to the Groups IA, IIA, IIB and VIIB of the Periodic System of the Elements, at a temperature from 80° to 180° C., while removing by-product water as it is formed, to produce the intermediates 1,1-bis(2,3-dihydroxy-5-tert.butylbenzene)-dimethyl ethane and 4-tert.butyl-6-isobutenylcatechol,

(b) subjecting to rearrangement in a second reaction stage the reaction mixture obtained, stripped of unreacted isobutyraldehyde, by contacting said reaction mixture with from 1 to 10 percent by weight, relative to the intermediates, of at least one catalytic acidic compound at a temperature from 180° to 250° C. and under a pressure equivalent to from 5 to 50 mm of mercury, while continuously removing by vaporization the rearrangement products 2,3-dihydro-2,2-dimethyl-5-tert-butyl-7-benzofuranol 4-tert-butyl catechol as they are formed, and

(c) recovering 2,3-dihydro-2,2-dimethyl-5-tert.butyl-7-benzofuranol from the vaporized products and dealkylating said compound in a third reaction stage in the presence of from 3 to 10 percent by weight of a catalyst selected from among acidic aluminas and phosphoric acid to obtain 2,3-dihydro-2,2-dimethyl-7-benzofuranol.

4,562,267

INTERMEDIATES OF HYPOGLYCEMIC 5-SUBSTITUTED OXAZOLIDINE-2,4-DIONES

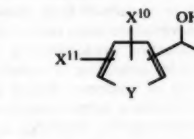
Rodney C. Schnur, Noank, Conn., assignor to Pfizer Inc., New York, N.Y.

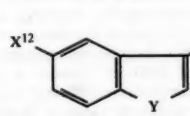
Division of Ser. No. 353,777, Mar. 1, 1982, Pat. No. 4,423,233, which is a division of Ser. No. 252,961, Apr. 23, 1981, Pat. No. 4,332,952, which is a continuation-in-part of Ser. No. 173,206, Jul. 28, 1980, abandoned. This application Oct. 14, 1983, Ser. No. 542,241

Int. Cl.[4] C07D *307/42, 307/80, 333/16, 333/56*

U.S. Cl. 549—58 **7 Claims**

1. A compound of the formula





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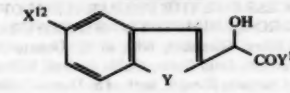
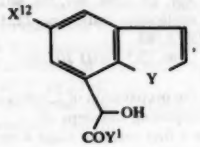


or



wherein

Y^1 is OR' or NH_2

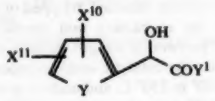
Y is sulfur or oxygen;

X^{10} is hydrogen, fluoro, chloro, bromo, iodo, methyl, phenyl, or (C_1–C_3)-alkoxy;

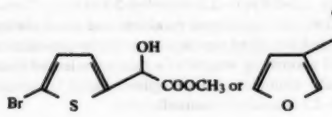
X^{11} is hydrogen or methyl;

X^{12} is hydrogen, fluoro, chloro, bromo or iodo; and

R' is (C_1–C_2)alkyl, with the provisos that when the compound is



at least one of X^{10} and X^{11} is other than hydrogen, and that the compound is other than



4,562,268

PROCESS FOR PRODUCING MALEIC ANHYDRIDE

James T. Wrobleski, St. Louis; James W. Edwards, Creve Coeur; Charles R. Graham, St. Charles; Robert A. Keppel, St. Louis, and Harold Raffelson, Olivette, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 28, 1983, Ser. No. 566,362

Int. Cl.[4] C07D *307/60*

U.S. Cl. 549—259 **29 Claims**

1. A process for the production of maleic anhydride by the oxidation of a non-aromatic hydrocarbon having at least four carbon atoms in a straight chain with molecular oxygen or a molecular oxygen-containing gas in the vapor phase at a temperature from about 300° C. to about 600° C. in the presence of a phosphorus-vanadium mixed oxide catalyst characterized by an average valence state of vanadium from about +3.9 to about +4.6, a phosphorus/vanadium atom ratio of about 0.5 to about 2.0, and a macrostructure predominantly comprising generally spheroidal particles consisting of radially oriented three-dimensional networks of randomly shaped open cells, and wherein the catalyst exhibits a weight/weight productivity to maleic anhydride of at least 70 g MAN/kg cat.-hr based upon a performance test conducted at a concentration of 1.5 mole percent hydrocarbon-in-molecular oxygen-containing gas, a space velocity of 1450 hr^{-1} under a pressure of 1.055×10^2 kPa-G, and a temperature sufficient to maintain the hydrocarbon conversion within the range of 70 mole percent to 90 mole percent and wherein the catalyst is prepared by the steps comprising:

(a) introducing substantially pentavalent vanadium-containing compound into an essentially anhydrous alcohol medium capable of reducing the vanadium to a valence state less than +5 to form a slurry;

(b) contacting the slurry with an effective amount of an alcohol-modifying agent selected from the group consisting of hydrogen iodide, sulfur dioxide, fuming sulfuric acid, and surfactants;

(c) effecting the reduction of at least a portion of the vanadium to a valence state of +4;

(d) adding a pentavalent phosphorus-containing compound to the vanadium-containing mixture before or after effecting the reduction to form a phosphorus-vanadium mixed oxide catalyst precursor;

(e) recovering the phosphorus-vanadium mixed oxide catalyst precursor;

(f) drying the catalyst precursor; and

(g) calcining the catalyst precursor at a temperature from about 250° C. to about 600° C.

4,562,269

METHOD OF PRODUCING MALEIC ANHYDRIDE

Eric L. Moorehead, Diamond Bar, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 275,370, Jun. 19, 1981, abandoned, and a continuation-in-part of Ser. No. 328,446, Dec. 7, 1981, Pat. No. 4,454,245, and a continuation-in-part of Ser. No. 335,531, Dec. 29, 1981, Pat. No. 4,455,388, which is a continuation-in-part of Ser. No. 328,446, Dec. 7, 1981, Pat. No. 4,454,245. This application May 6, 1983, Ser. No. 492,163

Int. Cl.[4] C07D *307/60*

U.S. Cl. 549—259 **52 Claims**

39. A process for oxidizing a hydrocarbon in the presence of an oxidation catalyst which comprises contacting a hydrocarbon in the gas phase with a catalyst comprising vanadium, phosphorus, and a microporous crystalline silica under oxidizing conditions producing maleic anhydride.

42. A process for oxidizing a hydro-carbon with an oxidation catalyst which comprises contacting a C_4 to C_{10} hydrocarbon with a catalyst comprising vanadium, phosphorus, tin and a microporous crystalline silica under oxidizing conditions producing maleic anhydride.

4,562,270

PROCESS FOR PREPARING UNSATURATED SIX-MEMBERED LACTONES

Hans-Georg Schmidt, Niederkassel, Fed. Rep. of Germany, assignor to Dynamit Nobel AG, Troisdorf, Fed. Rep. of Germany

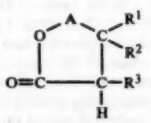
Continuation-in-part of Ser. No. 282,689, Jul. 13, 1981, Pat. No. 4,424,369, which is a division of Ser. No. 218,593, Dec. 19, 1980, Pat. No. 4,348,535. This application Oct. 11, 1983, Ser. No. 540,731

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1979, 2952068; Dec. 3, 1980, 3045455; Dec. 6, 1980, 3046059; Jul. 15, 1983, 3325505

Int. Cl.[4] C07D *309/32*

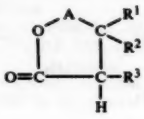
U.S. Cl. 549—294 **17 Claims**

1. A process for the preparation of a lactone of the formula

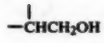


wherein A is a —CH=CH-moiety, R^1, R^2, and R^3 are hydro-

gen or C_1 to C_{10} alkyl which comprises heating a lactone of the formula



wherein A is a



group and R^1, R^2, and R^3 have the meaning given above at a temperature ranging from 200° to 500° C.

4,562,271

PREPARATION OF 3-ALKANOYLOXYPHTHALIDES

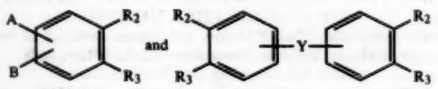
Visweswara R. Durvasula, Cheshire, Conn., assignor to The UpJohn Company, Midland, Mich.

Division of Ser. No. 460,177, Jan. 24, 1983, Pat. No. 4,485,247. This application Sep. 21, 1984, Ser. No. 652,921

Int. Cl.⁴ C07D *307/88*

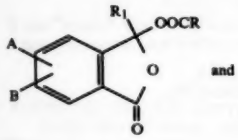
U.S. Cl. 549—310 **9 Claims**

1. A method for converting an aromatic compound selected from the formulae consisting of



V VI

to the corresponding 3-alkanoyloxyphthalide having the formulae



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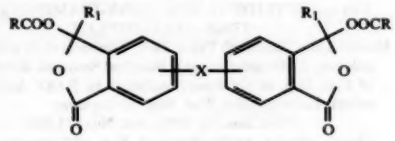


II

wherein R is lower-alkyl, R_2 and R_3 are independently selected from linear lower-alkyl, R_1 is selected from the group consisting of hydrogen and linear lower-alkyl having one less methylene unit than the corresponding R_2 or R_3 group, A and B taken separately are independently selected from the group consisting of hydrogen and inert substituents, A and B when taken together represent an aromatic nucleus fused to the phenyl ring, Y is selected from the group consisting of —CO—, —SO_2—, —O—, a single bond, and —CH_2—, and X is selected from the group consisting of —CO—, —SO_2—, —O—, and a single bond, said method comprising autoxidizing said aromatic compound in a solution comprising an anhydride of an aliphatic monocarboxylic acid having 2 to 8 carbon atoms with oxygen in the presence of a heavy metal oxidation catalyst and a promoter.

4,562,272

PROCESS FOR PREPARING CYCLIC POLYETHERS

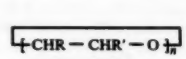
Arnold M. Harrison, South Charleston, and Leonard Kaplan, Dunbar, both of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 27, 1981, Ser. No. 248,268

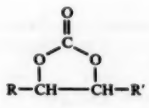
Int. Cl.⁴ C07D *323/00*

U.S. Cl. 549—352 **16 Claims**

1. A process for the preparation of cyclic polyethers of the formula:



from cyclic alkylene carbonates of the formula:



wherein R and R′ are each selected from the group consisting of hydrogen and alkyl having from 1 to 10 carbon atoms; n is an integer having a value of at least 3 wherein said process comprises providing in admixture at a temperature from about 100° C. to about 300° C. said cyclic alkylene carbonate, a solvent wherein said solvent contains at least one moiety from the group consisting of carbonyl, nitrile and mixtures thereof, and a catalyst selected from the group consisting of salts of Group IA, IIA, IB or IIB metals such that said cyclic polyether is produced.

4,562,273

PROCESS FOR PREPARING ESTERS OF FURAN BY A TRANSESTERIFICATION REACTION

Yves Le Bigot, St-Martin de Londres; Paul Audoye, Tarascon-sur-Ariege; Michel Delmas, Deyme, and Antoine Gaset, Toulouse, all of France, assignors to Agrifurane, S.A., Bon Encontre, France

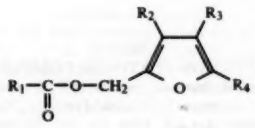
Filed Jun. 29, 1984, Ser. No. 626,112

Claims priority, application France, Jun. 29, 1983, 83 10950

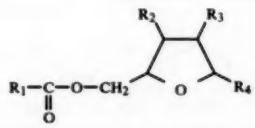
Int. Cl.⁴ C07D *307/68*

U.S. Cl. 549—473 **11 Claims**

1. A process for the preparation of an ester of furan of the formula

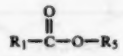


or

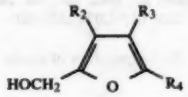


wherein R_1 is a hydrocarbon or furan radical, and R_2, R_3 and

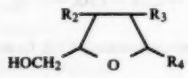
R_4 are each hydrogen or hydrocarbon radicals consisting essentially of subjecting an ester of the formula



wherein R_5 is a hydrocarbon radical, to a transesterification reaction with a furan alcohol of the formula



or



in the presence of a catalyst comprising an alkaline carbonate other than lithium carbonate at a temperature of 0° C. to 90° C.

4,562,274

PROCESS FOR THE PREPARATION AND ISOLATION OF POLYGLYCIDYL COMPOUNDS

Gebhard Rauleder, Belford Roxo, Brazil; Helmut Waldmann, Leverkusen, Fed. Rep. of Germany; Ludwig Bottenbruch; Hans-Joachim Traenckner, both of Kr[illegible]d, Fed. Rep. of Germany, and Wolfgang Gau, Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 12, 1983, Ser. No. 560,358

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1982, 3247255

Int. Cl.[4] C07D *301/14, 301/32*

U.S. Cl. 549—525 **8 Claims**

1. A process for the preparation of a polyglycidyl compound which comprises contacting diallyl hexahydrophthalate with a percarboxylic acid containing 3 or 4 carbon atoms, removing carboxylic acid formed from the percarboxylic acid by distilling the resultant reaction mixture to distill off said carboxylic acid to leave behind a mixture of unreacted diallyl hexahydrophthalate and epoxidized reaction product, contacting said mixture simultaneously with a lipophilic phase comprising n-heptane and benzene and a hydrophilic phase comprising methanol and water, removing said lipophilic phase from said hydrophilic phase, working up the resultant laden lipophilic phase, working up the resultant hydrophilic phase and obtaining a polyglycidyl compound from said laden hydrophilic phase.

4,562,275

ANTITUMOR PLATINUM COMPLEXES

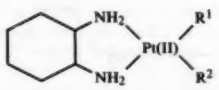
Robert J. Speer, Richardson, and David P. Stewart, Fort Worth, both of Tex., assignors to Bristol-Myers Co., New York, N.Y.

Filed Mar. 23, 1984, Ser. No. 592,987

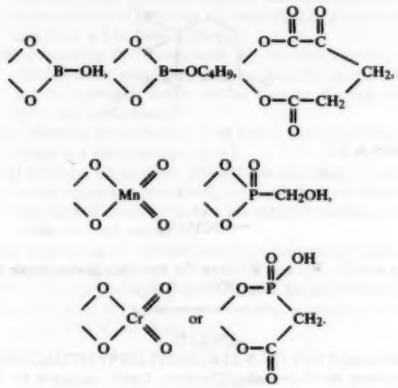
Int. Cl.[4] C07F *15/00, 11/00*

U.S. Cl. 556—7 **26 Claims**

1. A compound of the formula



wherein the stereoisomerism of 1,2-diaminocyclohexane is cis-, trans(+) or trans(−) and R^1 and R^2 when taken together represent a group of the formula



4,562,276

PEROXIDE COMPOSITION BASED ON TUNGSTEN AND PHOSPHORUS OR ARSENIC AND PROCESSES AND USES RELATIVE THERETO

Carlo Venturello; Rino D'Aloisio, and Marco Ricci, all of Novara, Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Nov. 10, 1983, Ser. No. 550,620

Claims priority, application Italy, Nov. 10, 1982, 24154 A/82

Int. Cl.[4] C07F *11/00*

U.S. Cl. 556—20 **30 Claims**

1. A compound of the formula (I):

$$Q_3XW_4O_{24-2n} \quad (I)$$

wherein Q represents a cation of a quaternary "onium" salt, X represents an atom of P or As, while n is an integer 0, 1 and 2.

4,562,277

PROCESS FOR THE PREPARATION OF A BIS-SALICYLIDENE-ALKYLENE-DIAMINOCOBALTOUS ION COMPLEX

Harald Laas, Maxdorf; Peter Tavs, Limburgerhof; Heinz Hannebaum, Ludwigshafen, and Manfred Stroezel, Ilvesheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 18, 1984, Ser. No. 571,806

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1983, 3302498

Int. Cl.[4] C07F *15/06*

U.S. Cl. 556—34 **2 Claims**

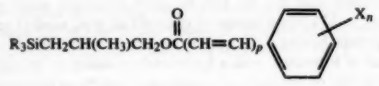
1. An improved process for the preparation of a bis-salicylidene-alkylenediamino-cobaltous ion complex by reacting salicylaldehyde with ethylenediamine in a mole ratio of about 2:1 and a cobalt salt wherein the salicylaldehyde and ethylenediamine are reacted in a solvent consisting of a linear or cyclic carboxamide which is disubstituted on the nitrogen atom and wherein the resultant reaction mixture is further reacted with a cobalt salt selected from the group consisting of cobalt carbonate and cobalt hydroxide carbonate at temperatures of 60° C. to 150° C.

4,562,278
ORGANOSILICON COMPOUNDS AND PREPARATION AND USE THEREOF

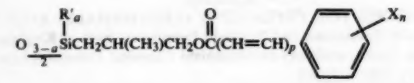
Michael P. Hill, Saint Lythans, Wales, assignor to Dow Corning, Ltd., Barry, Wales

Filed Oct. 12, 1984, Ser. No. 660,160
Int. Cl.[4] C07F 7/08, 7/10, 7/18
U.S. Cl. 556—418 9 Claims

1. Organosilicon compounds selected from
(1) silanes represented by the general formula



or
(2) siloxanes having at least one unit represented by the general formula



(i)

any other units present in the said siloxanes being those represented by the general formula

(ii)

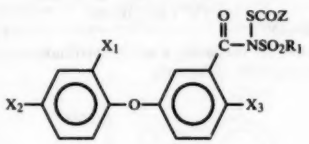
in which general formulae R represents a halogen atom, an alkyl group having from 1 to 4 carbon atoms or a phenyl group, an alkoxy group having less than 8 carbon atoms or an alkoxyalkoxy group having less than 8 carbon atoms, R′ represents an alkoxy group having less than 8 carbon atoms, a methyl group or a phenyl group, X represents a hydroxyl group, methoxy group or ethoxy group when p=1 or a hydroxyl group or —NQ_2 group, in which each Q is lower alkyl, when p=0, Z represents a hydrogen atom, a monovalent hydrocarbon group or a monovalent halogenated hydrocarbon group, a is 0, 1 or 2, b is 0, 1, 2 or 3, n is 0 or 1 and p is 0 or 1.

4,562,279
HERBICIDAL N-SUBSTITUTED-5-(SUBSTITUTED-PHENOXY)-2-SUBSTITUTED BENZOIC ACID SULPHONAMIDES

El-Ahmadi I. Heiba, 11 Balsam La., Princeton, N.J. 08540

Filed Sep. 28, 1982, Ser. No. 425,429
Int. Cl.[4] C07C 143/67
U.S. Cl. 560—12 8 Claims

1. Compounds having herbicidal activity of the formula



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wherein:
R_1 is an alkyl group of 1 to 6 carbon atoms or a optionally substituted by one or more halogen atoms; phenyl group optionally substituted by one or more halogen atoms;
Z is an oxy moiety (OR_2); sulfenyl moiety (SR_2); NH_2; NHR_2; $N(R_2)_2$; $R_2CH{=}N{-}O$; $(R_2)_2CH{=}N{-}O$, and R_2 includes phenyl optionally substituted; heterocycle having from 5 to 7 atom rings optionally substituted; (C_1–C_4) alkyl; (C_1–C_4)alkyl optionally substituted with halogen, OH, SH, O-alkyl, S-alkyl, furfuryl, phenyl, COO alkyl, CN, or C≡CH; X_1 is Cl; X_2 is CF_3 and X_3 is NO_2.

4,562,280
CHLOROMETHYLATION OF DEACTIVATED AROMATIC COMPOUNDS

Jo Ann Gilpin, and Lowell B. Lindy, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 18, 1984, Ser. No. 662,461
Int. Cl.[4] C07C 69/76
U.S. Cl. 560—103 16 Claims

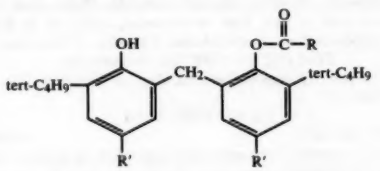
1. A process for the chloromethylation of an aromatic compound, substituted with an alkyl group and a deactivating moiety, which comprises contacting an aromatic compound, substituted with an alkyl group and a deactivating group, with a chloromethyl alkyl ether in the presence of a catalytic amount of ferric chloride or stannic chloride, under conditions such that an aromatic compound, substituted with an alkyl group, a chloromethyl group, and a deactivating group, wherein the alkyl and chloromethyl groups are on adjacent carbon atoms, is prepared.

4,562,281
PRODUCTION OF BISPHENOL DERIVATIVES

Yukoh Takahashi, Toyonaka; Yutaka Terada, Nishinomiya; Shinichi Yachigo, Toyonaka, and Tamaki Ishii, Suita, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Dec. 14, 1983, Ser. No. 561,207
Int. Cl.[4] C07C 67/08
U.S. Cl. 560—104 12 Claims

1. A method for producing bisphenol derivatives represented by the formula (I),

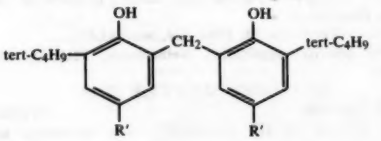


(I)

wherein R represents an alkyl group having 1 to 3 carbon atoms, alkenyl group having 2 to 4 carbon atoms, phenyl group or 2-phenyl-ethenyl group, and R′ represents an alkyl group having 1 to 4 carbon atoms, characterized in that a carboxylic acid represented by the formula (II),

(II)

wherein R has the same meaning as above, is reacted at a temperature of −20° C. to 150° C. with a bisphenol represented by the formula (III),



(III)

wherein R′ has the same meaning as above, adding a halogenating agent selected from the group consisting of phosphoryl chlorides, phosphoryl bromides and toluenesulfonyl chloride to the reaction mixture, wherein the reaction is carried out in

the presence of a dehydrohalogenating agent selected from the group consisting of tertiary amines and pyridine derivatives.

4. A method as described in claim 1, wherein the carboxylic acid is one member selected from the group consisting of acetic acid, propionic acid, butyric acid, acrylic acid, methacrylic acid, crotonic acid, 3-butenoic acid, benzoic acid and cinnamic acid.

4,562,282

4-METHYL-3-FORMYL-PENTANOIC ACID ESTERS

Jacques Martel, Bondy; Jean Tessier, Vincennes, and Jean-Pierre Demoute, Montreuil-sous-Bois, all of France, assignors to Roussel Uclaf, Paris, France

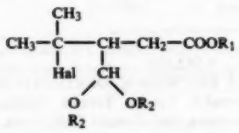
Division of Ser. No. 536,888, Sep. 28, 1983, abandoned, which is a division of Ser. No. 352,257, Feb. 25, 1982, Pat. No. 4,421,928. This application Jun. 17, 1985, Ser. No. 745,639

Claims priority, application France, Feb. 26, 1981, 81 03832

Int. Cl.⁴ C07C *69/708*

U.S. Cl. 560—184 **1 Claim**

1. A compound of the formula



wherein Hal is a halogen and R_1 and R_2 are individually alkyl of 1 to 12 carbon atoms.

4,562,283

CONTINUOUS SEPARATION OF MALEIC ANHYDRIDE FROM GASEOUS REACTION MIXTURES

Rolf Schnabel, Schifferstadt, and Hans M. Weitz, Bad Durkheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 14, 1984, Ser. No. 681,593

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1983, 3346134

Int. Cl.⁴ C07C *67/08*

U.S. Cl. 560—204 **2 Claims**

1. A process for the continuous separation of maleic anhydride from a gaseous reaction mixture obtained by catalytic oxidation of hydrocarbons at from 250° to 600° C., by treatment of the gaseous reaction mixture with a solvent, wherein the gaseous reaction mixture which contains maleic anhydride and has been cooled to 50°–200° C. and from 0.2 to 10 moles of butanol per mole of maleic anhydride are fed into the lower part of a column, water is removed from the column above this feed point, from 0.2 to 20 moles of dibutyl maleate per mole of maleic anhydride are fed in via the top of the column, and the liquid product containing butyl maleate is removed from the bottom of the column.

4,562,284

PROCESS FOR THE PREPARATION OF CARBOXYLIC ACIDS

Eit Drent, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

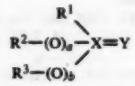
Filed Feb. 24, 1984, Ser. No. 583,477

Claims priority, application Netherlands, Mar. 2, 1983, 8300763

Int. Cl.⁴ C07C *51/09*; C01B *25/14*

U.S. Cl. 562—406 **6 Claims**

1. A process for the preparation of a carboxylic acid RCOOH wherein R represents an alkyl group having 1–20 carbon atoms, a cycloalkyl group having 5–10 carbon atoms or an aralkyl aralkyl group having 7–13 carbon atoms by heating at a temperature from about 110° to about 225° C. an ester of formic acid HCOOR in the presence of carbon monoxide, and a catalyst system consisting essentially of a soluble rhodium catalyst and an iodide and/or bromide source, and as promoter a compound of the formula



I

wherein a and b are both 0, X is phosphorus and Y is oxygen or sulphur and R^1, R^2 and R^3 each represent alkyl groups having 1–12 carbon atoms or cycloalkyl, aryl, aralkyl or aralkyl groups having 5–12 carbon atoms, or a complex of a compound of formula I with a hydrocarbon iodide or bromide, an acyl iodide or bromide or a hydrogen iodide or bromide.

4,562,285

PROCESS FOR PRODUCING TEREPHTHALIC ACID

Hiroshi Hashizume, and Yoshiaki Izumisawa, both of Kitakyusya, Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Continuation of Ser. No. 306,764, Sep. 29, 1981, abandoned, which is a continuation of Ser. No. 860,480, Dec. 14, 1977, abandoned. This application Jan. 22, 1985, Ser. No. 693,232

Claims priority, application Japan, Dec. 30, 1976, 51-158986; Dec. 30, 1976, 51-158988

The portion of the term of this patent subsequent to Dec. 24, 2002, has been disclaimed.

Int. Cl.⁴ C07C *51/16*

U.S. Cl. 562—414 **9 Claims**

1. In a process for producing terephthalic acid by oxidizing para-xylene with molecular oxygen in acetic acid as a solvent in the presence of a catalyst system containing cobalt, manganese and bromine, the improvement for suppressing the formation of the by-product methyl acetate, which comprises: separating solid terephthalic acid from the terephthalic acid slurry resulting from the reaction to form the mother liquor, subjecting the mother liquor to distillation to separate and recover at least a portion of the methyl acetate present therein and then circulating the thus recovered methyl acetate into the reactor.

4,562,286

PROCESS FOR PREPARING METHOXYTRIFLUOROMETHYLNAPHTHOIC ACID FROM DIMETHYLNAPHTHALENE

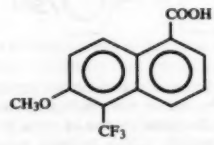
Arthur M. Foster, Lewiston, N.Y., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Nov. 1, 1984, Ser. No. 667,183

Int. Cl.⁴ C07C *63/34*

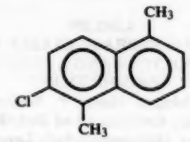
U.S. Cl. 562—467 **12 Claims**

1. A process for preparing a methoxytrifluoromethylnaphthoic acid compound of formula

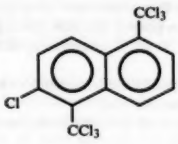


comprising the steps of

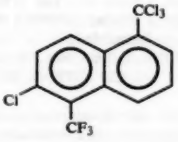
(a) chlorinating 1,5-dimethylnaphthalene in the liquid phase to prepare a chlorodimethylnaphthalene of formula



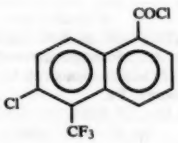
(b) photochlorinating the chlorodimethylnaphthalene of step (a) in the liquid phase to prepare a chloro-bis(trichloromethyl)naphthalene of formula



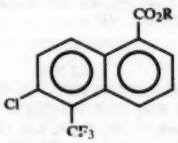
(c) fluorinating the chloro-bis(trichloromethyl)naphthalene of step (b) in the liquid in the presence of a halogen transfer catalyst to prepare a chlorotrifluoromethyltrichloromethylnaphthalene of formula



(d) hydrolyzing the chlorotrifluoromethyltrichloromethyl naphthalene of step (c) in the presence of iron or a Lewis Acid catalyst to prepare a chlorotrifluoromethylnaphthoyl acid chloride of formula

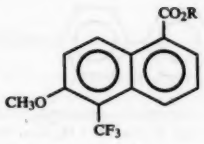


(e) esterifying the chlorotrifluoromethylnaphthoyl acid chloride of step (d) by reaction with a lower alkanol to prepare a chlorotrifluoromethylnaphthalate of formula



where R is methyl, ethyl, propyl or butyl,

(f) methoxylating the chlorotrifluoromethylnaphthalate of step (e) by reaction with sodium methoxide in the presence of a cuprous halide to prepare a methoxytrifluoro methylnaphthalate of formula



where R is defined in step (e), and

(g) hydrolyzing the methoxytrifluoromethylnaphthalate of step (f).

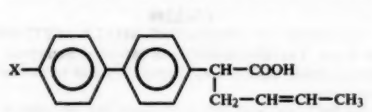
4,562,287

2-(4-BIPHENYLYL)-4-HEXENOIC ACID AND DERIVATIVES THEREOF HAVING ANTI-INFLAMMATORY ACTIVITY

Alfonso Del Vecchio, and Grazia Sestini, both of Milan, Italy, assignors to Scharper S.p.A. per l'Industria Farmaceutica, Milan, Italy

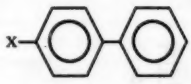
Filed May 29, 1984, Ser. No. 614,754
Claims priority, application Italy, Jun. 3, 1983, 21456 A/83
Int. Cl.[4] C07C *63/33*
U.S. Cl. 562—492 **3 Claims**

1. Process for preparing compounds of general formula:

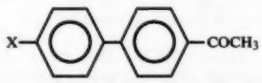


wherein X is hydrogen or fluorine or chlorine, which comprises the following process steps:

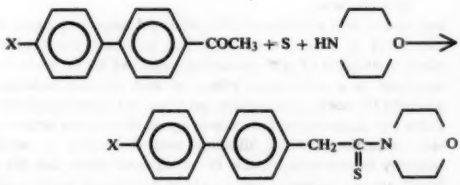
(a) reacting the diphenyl compound



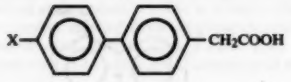
with $AlCl_3$ and acetyl chloride CH_3COCl, in inert organic solvent, at temperature between 20° and 50° C., obtaining the corresponding acetophenonic compound:



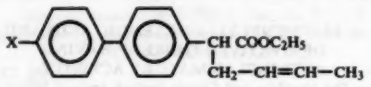
(b) the acetophenonic compound is reacted with sulphur and morpholine at reflux temperature of the reaction mixture, according to the scheme:



(c) the above intermediate compound is reacted with an excess of acetic acid in presence of HCl at the boiling temperature of the reaction mixture, obtaining the corresponding 4-biphenyl-acetic acid of formula



(d) the above intermediate compound is converted by conventional method ($C_2H_5OH+H_2SO_4$) in the corresponding ethyl ester which is reacted with $BrCH_2—CH=CH—CH_3$ in presence of NaH, in inert solvent, at the boiling temperature of the reaction mixture, wherein the ester of formula:



is obtained;

(e) the above intermediate ester is hydrolysed by treatment in aqueous solution of alkaline hydroxide, at boiling temperature of the mixture, wherein the final product is obtained.

4,562,288

METHOD OF OPERATING MIXER-SETTLER

Kunio Koga; Yukihiro Sasaki, and Mutsumi Samejima, all of Himeji, Japan, assignors to Daicel Chemical Industries, Ltd., Sakai, Japan

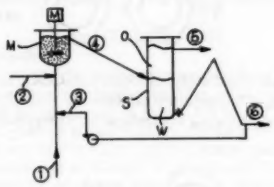
PCT No. PCT/JP83/00224, § 371 Date Jan. 10, 1984, § 102(e) Date Jan. 10, 1984, PCT Pub. No. WO84/00310, PCT Pub. Date Feb. 2, 1984

PCT Filed Jul. 12, 1983, Ser. No. 574,092

Claims priority, application Japan, Jul. 13, 1982, 57-121426

Int. Cl.⁴ C07B *51/42*

U.S. Cl. 562—608 **6 Claims**



1. A method of recovering acetic acid from an aqueous acetic acid solution, comprising the steps of: feeding into the mixer of a mixer-settler extraction system

(1) said aqueous solution of acetic acid, and

(2) a liquid organic extracting agent comprising a tertiary amine having a boiling point higher than the boiling point of acetic acid,

and mixing said aqueous solution and said extracting agent in said mixer so as to form a dispersion in which the disperse phase is droplets of said extracting agent which droplets are dispersed in a continuous phase of said aqueous solution, whereby the acetic acid is extracted from said aqueous solution and is transferred to said extracting agent; then, in the settler of said extraction system, allowing said dispersion to settle whereby to obtain separately (i) an aqueous phase and (ii) a liquid organic extracting agent phase containing acetic acid; and recycling a part of said aqueous phase directly into said mixer in an amount effective to maintain, in said mixer, the volumetric ratio of (a) the aqueous phase (i) plus the aqueous solution (1), to (b) the total liquids in said mixer, at a level effective to maintain said dispersion in a stable condition in said mixer.

4,562,289

HOMOGENEOUS STORAGE STABLE CYANAMIDE SOLUTIONS IN POLYOLS AND A PROCESS FOR THEIR PRODUCTION

Manfred Hajek, Cologne; Hanns P. Müller, Odenthal, and Werner Rasshofer, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 22, 1985, Ser. No. 714,731

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1984, 3412086

Int. Cl.⁴ C07C *125/00*

U.S. Cl. 564—2 **20 Claims**

1. A process for the production of a homogeneous storage stable cyanamide in polyol solution having a cyanamide content of from 0.1 to 50 wt % comprising dehydrating a mixture of

(a) an aqueous cyanamide solution containing from 10 to 55 wt % of cyanamide and

(b) at least one polyol having a molecular weight of from 62 to 12,000

at a pressure below 100 mbar and a temperature of from 40°–130° C.

4,562,290

ALKYLENE OXIDE ADDUCTS OF VICINAL TOLUENEDIAMINE

Alexander Korczak, Grosse Ile, and William W. Levis, Jr., Wyandotte, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 1, 1981, Ser. No. 326,314

Int. Cl.⁴ C07C *89/02*

U.S. Cl. 564—399 **10 Claims**

1. An adduct of vicinal toluenediamine prepared by (a) reacting vicinal toluenediamine with from one to three moles of ethylene oxide per mole of vicinal toluenediamine at a temperature of 125° C. or less, and (b) reacting the product of (a) with from four to eight moles of propylene oxide at a temperature of at least 140° C. in the presence of at least 1.0 part of an alkali metal hydroxide catalyst based upon 100 parts of vicinal toluenediamine.

4,562,291

OLIGOMERIZATION OF ALKYL GROUPS ON AMINES

Robert B. Wilson, Jr., Mountainview, and Richard M. Laine, Palo Alto, both of Calif., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Dec. 19, 1984, Ser. No. 683,531

Int. Cl.⁴ C07C *85/00*

U.S. Cl. 564—463 **17 Claims**

1. A process for the oligomerization of alkylamines to produce longer carbon chain alkylamines, said process comprising: contacting said alkylamine with a catalyst mixture comprising a tetra-fluoroborate salt and a ruthenium, an osmium, or an iridium containing compound in a ratio of between 1:1 to 1:100 at a temperature between 50° and 250° C. and at a pressure between 1 atm and 300 atm.

4,562,292

TRIFLUOROMETHYLKETONE SULFIDES AND REVERSIBLE ENZYME INHIBITION THEREWITH

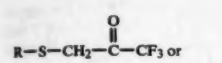
Bruce D. Hammock, Davis, Calif., and Christopher A. Mullin, State College, Pa., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Aug. 18, 1983, Ser. No. 524,528

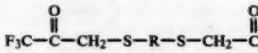
Int. Cl.⁴ C07C *151/00*

U.S. Cl. 568—043 **13 Claims**

1. A compound of the formula



or



wherein R is a substituent having at least 5 multivalent atoms.

4,562,293

SPIROKETONE PROCESS

Jerry M. Roper, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Oct. 15, 1984, Ser. No. 660,860

The portion of the term of this patent subsequent to Oct. 30, 2001, has been disclaimed.

Int. Cl.⁴ C07C *45/45*

U.S. Cl. 568—347 **13 Claims**

1. A process which comprises reacting a phenol having a free p-position with formaldehyde, a nitrogen compound selected from ammonia and primary and secondary amines, and a conjugated diene in an inert solvent at a temperature of at least about 190° C. so as to form a spiro[5.5]undeca-1,4,8-trien-3-one.

4,562,294

SPIROKETONE PROCESS

Jerry M. Roper, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Oct. 15, 1984, Ser. No. 660,859

The portion of the term of this patent subsequent to Oct. 30, 2001, has been disclaimed.

Int. Cl.⁴ C07C *45/45*

U.S. Cl. 568—362 **12 Claims**

1. A process which comprises heating a reaction mixture consisting essentially of a 4-aminomethylphenol, a conjugated diene, and an inert solvent at a temperature of at least about 190° C. so as to form a spiro[5.5]undeca-1,4,8-trien-3-one.

4,562,295

METHOD OF PURIFYING CYCLOHEXANONE CONTAINING BY-PRODUCT ORGANIC ACIDS

Shigeo Miyata, Takamatsu, Japan, assignor to Kyowa Chemical Industry Co., Ltd., Tokyo, Japan

Filed Aug. 3, 1984, Ser. No. 637,591

Claims priority, application Japan, Aug. 5, 1983, 58-142457

Int. Cl.⁴ C07C *45/79*

U.S. Cl. 568—366 **4 Claims**

1. A method for purifying cyclohexanone containing by-product organic acids and obtained by oxidation of cyclohexane, which comprises contacting said cyclohexanone with at least one treating agent selected from the group consisting of hydrotalcite compounds of the following fomula (1)

$$M_x^{2+}M_2^{3+}(OH)_{2x+6-nz}(A^{n-})_z mH_2O \quad (1)$$

wherein M^{2+} represents a divalent metal ion selected from the group consisting of Mg^{2+}, Ca^{2+}, Zn^{2+}, Co^{2+}, Ni^{2+} and Cu^{2+}, M^{3+} represents a trivalent metal ion selected from the group consisting of Al^{3+}, Fe^{3+}, Cr^{3+}, Ni^{3+}, Co^{3+} and Mn^{3+}, A^{n-} represents an anion having a valence of n and is selected from the group consisting of Cl^-, Br^-, I^-, F^-, OH^-, CO_3^{2-}, SO_4^{2-}, HPO_4^{2-}, $Fe(CN)_6^{3-}$, $Fe(CN)_6^{4-}$, Ch_3COO^-, $(COO)_2^{2-}$, a citrate ion, a tartrate ion and a benzoate ion, and x, z and m represent numbers satisfying the following expressions

$1<x<20$,

$0<z\leqq 2$,

$0\leqq m<20$,

and metal oxide-type solid solutions of the following formula (2)

$$M_{1-x'}^{2+}M_{x'}^{3+}O_{1+\frac{1}{2}x'} \quad (2)$$

wherein M^{2+} and M^{3+} are as defined with respect to formula (1), and x' is a number represented by $O<x'<0.5$, and showing a powder X-ray diffraction pattern corresponding to $M^{2+}O$.

4,562,296

PRODUCTION OF ALDEHYDES AND KETONES

Duane C. Hargis, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Nov. 13, 1984, Ser. No. 671,172

Int. Cl.⁴ C07C *45/45*

U.S. Cl. 568—388 **16 Claims**

1. A process which comprises the step of pyrolyzing an alcohol having 2 to 10 carbon atoms or an aldehyde having 2 to 10 carbon atoms, or both, over a metal oxide catalyst consisting essentially of a major proportion of ferric oxide and a minor proportion of a Group IV-A metal oxide so that at least higher molecular weight ketone or lower molecular weight aldehyde is formed.

4,562,297

ALDEHYDE SYNTHESIS

Jerry M. Roper, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 412,150, Aug. 27, 1982, abandoned. This application Nov. 2, 1984, Ser. No. 667,916

Int. Cl.⁴ C07C *45/36, 47/565*

U.S. Cl. 568—432 **14 Claims**

1. A process which comprises intimately contacting a 4-(1-alkenyl)-2,6-dihydrocarbylphenol with at least a stoichiometric amount of an oxygen-containing gas at about 50°-250° C. in the presence of an alcohol solvent and a catalytic amount of an alkali or alkaline earth metal hydroxide so as to form a 3,5-dihydrocarbyl-4-hydroxybenzaldehyde.

4,562,298

OPTICALLY ACTIVE NORDIHYDROGUAIARETIC ACID AND INTERMEDIATES

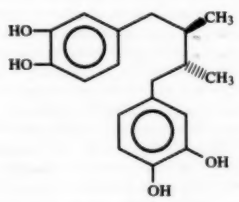
Robert M. Parkhurst, Redwood City, Calif., and Ronald S. Pardini, Reno, Nev., assignors to Chemex Pharmaceuticals, Inc., Denver, Colo.

Filed Oct. 25, 1982, Ser. No. 436,444

Int. Cl.⁴ C07C *43/205, 43/263, 39/16*

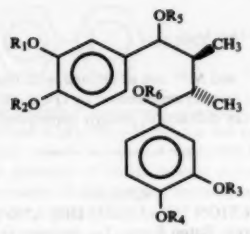
U.S. Cl. 568—644 **3 Claims**

1. A composition of matter selected from the group consisting of optically active d,l-nordihydroguaiaretic acid isomers of the formula:



its antipode, and racemic mixtures thereof.

2. A composition of matter selected from the group consisting of d,l-isomers of the formula:



where

R_1, and R_2, are lower alkyl and aralkyl, and R_3, and R_4 are lower alkyl and aralkyl, and R_5 and R_6 are lower alkyl, alkenyl, aryl, aralkyl, or aralkenyl groups, or silyl, or substituted silyl with from one to three substituents which are lower alkyl, alkenyl, aryl, aralkyl or aralkenyl groups;

its antipode, and racemic mixtures thereof.

4,562,299

PROCESS FOR THE PREPARATION OF VICINAL DIOLS SOLUBLE IN WATER

Carlo Venturello, and Mario Gambaro, both of Novara, Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Dec. 12, 1984, Ser. No. 680,833

Claims priority, application Italy, Dec. 16, 1983, 24203 A/83

Int. Cl.⁴ C07C *29/03, 31/20, 31/27, 33/26*

U.S. Cl. 568—811 **12 Claims**

1. A process for the preparation of a water-soluble vicinal diol by means of the catalytic hydroxylation of the corresponding olefine with H_2O_2, characterized in that an olefine, possibly carrying functional groups inert under the reaction conditions and whose corresponding vicinal diol is soluble in water, is made to react, under vigorous stirring, with H_2O_2 at a temperature between 0° and 120° C., and at a pressure between 1 and 100 atmospheres, in a two-phase aqueous liquid/organic liquid system consisting essentially of an acid aqueous phase containing H_2O_2 and an organic phase containing:

(1) the above said olefine;

(2) possibly a solvent immiscible with the aqueous phase; and

(3) a catalyst of the formula $Q_3XW_4O_{24-2n}$

wherein

Q represents an onium $(RR_1R_2R_3M)^+$ in which M is chosen from amongst N, P, As and Sb, and R, R_1, R_2 and R_3, equal to or different from each other, represent hydrogen atoms or hydrocarbon groups having a total of from 20 to 70 carbon atoms;

X is an atom of P or As; and

n is an integer chosen from among 0, 1 and 2.

4,562,300

MERCAPTAN EXTRACTION PROCESS

Carl J. LaFoy, Houston, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 19, 1985, Ser. No. 725,274

Int. Cl.⁴ C07C *7/10*

U.S. Cl. 585—854 **8 Claims**

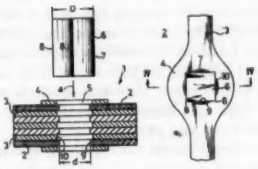
1. A process for removing mercaptans from a hydrocarbon feed stream using a caustic solution comprising contacting said hydrocarbon feedstream with said caustic, separating said hydrocarbon feedstream from said caustic, oxidizing said caustic stream to convert removed mercaptans to disulfides, settling the thus treated caustic to separate the majority of said disulfides and contacting the remaining caustic solution containing sulfides and disulfides with a portion of said separated hydrocarbon feedstream to remove the remaining disulfides.

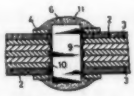
4,562,301

THROUGH-HOLE PIN FOR LAMINATED CIRCUIT SUBSTRATES AND METHOD OF INSERTION THEREOF

Eiichi Kameda, and Seiichi Tobe, both of Ibaraki, Japan, assignors to Nippon Mektron Ltd., Japan

Filed Feb. 7, 1984, Ser. No. 577,773
Claims priority, application Japan, Feb. 8, 1983, 58-19135
Int. Cl.[4] H05K *1/14, 3/00*
U.S. Cl. 174—68.5 12 Claims





1. A multilayer laminated circuit assembly having a through-hole connection, the assembly including:

a plurality of conductive circuit elements on a plurality of insulating substrates, the conductive circuit elements and substrates being in a laminated array;

at least one through-hole in said laminated array through at least two conductive elements and one insulating substrate;

pin connecting means in said through hole for interconnection between said at least two conductive elements;

said pin connecting means having a body portion, said body portion being electrically conductive, said body portion having an outside surface;

at least one ridged region being on the outside surface of said body portion, said ridged region being located along the direction of said through-hole and penetrating into said at least two conductive elements whereby said ridged region effects electrical and mechanical contact between said body portion and each of said conductive elements; and

solder material surrounding at least a portion of said pin connecting means and further electrically connecting said two conductive elements.

4,562,302

INSIDE TELECOMMUNICATION CABLE

John A. Checkland, and Leo V. Woytiuk, both of Pointe Claire, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Continuation-in-part of Ser. No. 309,252, Oct. 5, 1981, abandoned. This application Dec. 21, 1982, Ser. No. 451,944
Int. Cl.[4] H01B *7/00*
U.S. Cl. 174—118 4 Claims

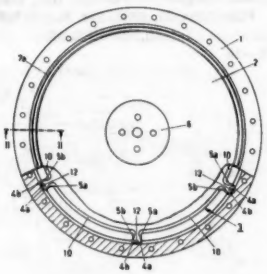
1. A fire-retardant inside cable consisting essentially of a core, a core wrap material of fire retardant material and a surrounding fluorine based polymer jacket, the core comprising a plurality of insulated electrical conductors in which the insulation is formed from a compound based upon polyvinylchloride, the insulated conductors defining between them interstices which contain a filler consisting essentially of fire resistant hydrated inorganic powder.

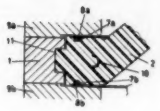
4,562,303

DISC-TYPE INSULATOR WITH A CAST-IN ELECTRODE AND PROCESS FOR ITS MANUFACTURE

Franz Czech, Niederhasli, Switzerland, assignor to BBC Brown, Boveri & Company, Ltd., Switzerland

Filed Mar. 2, 1984, Ser. No. 585,843
Claims priority, application Switzerland, Mar. 4, 1983, 1190/83
Int. Cl.[4] H01B *17/42, 17/18;* H02G *5/06*
U.S. Cl. 174—142 11 Claims





1. An insulator for a high-voltage cable of the type in which a central conductor is supported by said insulator along the axis of an axially elongated, gas-filled outer enclosure, said insulator comprising:

(a) an insulator body symmetrically disposed around a longitudinal axis and having a central opening for accommodating a central conductor and an outer periphery which is shaped to fit the interior of an outer enclosure; and

(b) an electrode embedded within said insulator body and symmetrically encircling said axis of said insulator body, said electrode being disposed closely adjacent one of the periphery of said central opening or said outer periphery of said insulator body and serving to limit the occurrence of corona discharge over the surface of said insulator body, said electrode comprising:

(1) a plurality of serially arranged elongated electrode segments which are disposed in a path following said one of said peripheries of said insulator body, each segment being electrically coupled to its respective adjacent segment; and

(2) at least one radially extending contact tongue for each of said segments which extends towards said one of said peripheries to allow said electrode to be electrically accessible exteriorly of said one of said peripheries.

10. A method for manufacturing a cast insulator for a high-voltage cable, said method comprising the steps of:

(a) forming a plurality of elongated electrode segments to have an integral contact tongue and an integral electrode contact extending therefrom, said contact tongue being formed by bending a portion of said segment reentrantly, said electrode contact being formed by bending a portion of said contact tongue so that said electrode contact is disposed in a plane spaced from and substantially parallel to the plane containing said segment;

(b) arranging said electrode segments serially in a casting mold adjacent one another in a path following a periphery of said mold and being oriented such that said contact

tongue is generally perpendicular to said periphery and said contact electrode is parallel to said periphery;

(c) securing said electrode segments to said periphery of said mold, said segments being secured to said periphery adjacent said electrode contacts;

(d) filling said mold with a castable insulating material; and

(e) curing said material.

4,562,304

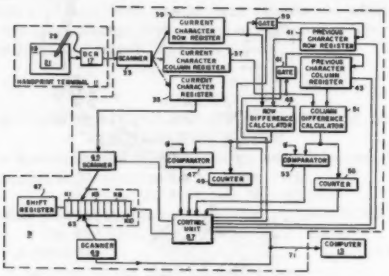
APPARATUS AND METHOD FOR EMULATING COMPUTER KEYBOARD INPUT WITH A HANDPRINT TERMINAL

Jean R. Ward, Arlington, and Andrew H. Nilssen, Needham, both of Mass., assignors to Pencept, Inc., Waltham, Mass.

Filed May 23, 1984, Ser. No. 613,099

Int. Cl.[4] G06K *9/10*

U.S. Cl. 178—18 **14 Claims**



1. Apparatus for emulating computer keyboard input from output of a handprint terminal, the output comprising data corresponding to each character along with row and column position data for each character, said apparatus comprising:

a. a control unit

b. means for receiving the output of the handprint terminal and separating the character data, row position data and column position data for each character into separate signal paths,

c. a line buffer memory having a row of memory cells for temporary storage of characters in the same row,

d. means for comparing the row and column position of each character with the row and column position of the character immediately preceeding it and transmitting signals indicative of the comparison thereof to said control unit.

e. means responsive to signals from said control unit for loading the characters as they are received into the line buffer memory at memory cell locations according to their column positions, a row at a time, and

f. means for sequentially reading out the characters stored in the memory cells in the line buffer memory.

4,562,305

SOFTWARE CRYPTOGRAPHIC APPARATUS AND METHOD

John E. Gaffney, Jr., Bethesda, Md., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1982, Ser. No. 452,248

Int. Cl.[4] H04L *9/02*

U.S. Cl. 178—22.08 **3 Claims**

1. An improved software cryptographic apparatus in a data processing system including a program storage addressed by an instruction sequencer and an arithmetic logic unit for executing instructions accessed from the program storage, comprising:

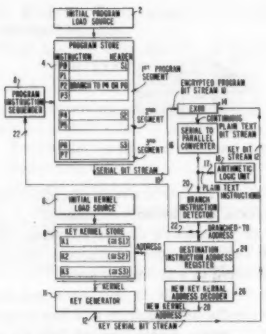
a key kernel store having a plurality of N storage locations for N key kernels, each said key kernel being an initial value of a deciphering sequence corresponding to one of a plurality of N definable sequential program segments stored in said program storage, each said program segment being a plurality of consecutive ones of said instructions;

a key generator having an input connected to the output of said key kernel storage and having a key bit stream output, for operating on one of said plurality of key kernels and generating a sequence of key bits corresponding to said one of said plurality of key kernels output from said key kernel storage;

an exclusive OR gate having a first input connected to said encrypted program bit stream line and a second input connected to said key bit stream line, for carrying out an exclusive OR function between corresponding bits from said encrypted program bit stream and from said key bit stream so as to produce a plain text program output;

said arithmetic logic unit having its control input connected to said output from said exclusive OR;

a branch instruction detector having an input connected to the output of said exclusive OR, for detecting the occurrence of a branch instruction from said program storage



and outputting the destination address of the definable program segment to be branched to;

said instruction sequencer having a branch control input connected to the output of said branch detector;

a key address decoder having an input connected to the output of said branch detector and an output connected to an address input of said key kernel storage, for accessing the key kernel stored in said key kernel storage which corresponds to the destination address of the program instruction which is at the head of the definable program segment to which the program is branching;

said key kernel storage outputting in response to said key address decoder, a second key kernel to said key generator, which corresponds to said destination address of said second definable program segment, for generating a second key bit stream corresponding to the encrypted program bit stream output from said program storage upon accessing said second definable program segment;

whereby an encrypted program can be continuously decrypted while branching and interrupt operations occur.

4,562,306

METHOD AND APPARATUS FOR PROTECTING COMPUTER SOFTWARE UTILIZING AN ACTIVE CODED HARDWARE DEVICE

Wayne W. Chou, 19 Sea Beach Dr., Stamford, Conn. 06902, and Richard E. Erett, 78 White Birch La., Stamford, Conn. 06905

Filed Sep. 14, 1983, Ser. No. 531,956

Int. Cl.[4] G06F *11/00*

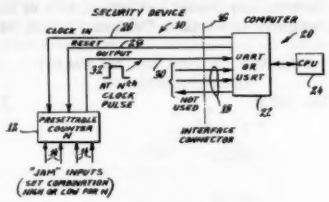
U.S. Cl. 178—22.08 **11 Claims**

1. An active coded hardware security apparatus for protecting software which is adapted to be connected by an interface

connector to a communications port of a computer, said computer being directed by a coded software program which is interfaced with said hardware through said communications port, said hardware apparatus comprising:

a presettable (programmable) counter to provide a preset numerical code output which is outputted when interrogated in proper sequence,

an interface connector connected to said counter which is adapted to be plugged into a communications port of a computer whose software is to be protected,



a clock input, a reset input and an output line connected between said presettable counter and said interface connector,

said counter being active and transmitting said preset output over said output line,

whereby said counter is interrogated by said computer under control of said coded software to determine whether said hardware apparatus is installed and generating the proper response to enable the coded software program to continue.

4,562,307

TRANSMITTER-RECEIVER STATION HAVING LOW POWER CONSUMPTION FOR A TWO-WAY COMMUNICATION LINK

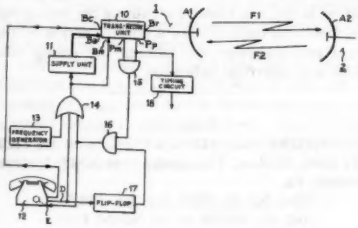
Jacques Bursztejn, Paris, and Lucien Babany, Le Blanc Mesnil, both of France, assignors to Thomson-CSF, Paris, France

Filed Aug. 13, 1984, Ser. No. 640,195

Claims priority, application France, Aug. 17, 1983, 83 13394

Int. Cl.⁴ H04Q *7/04*; H04B *1/16*

U.S. Cl. 179—2 E **3 Claims**



1. A transmitter-receiver station for a two-way communication link, comprising a transmitter-receiver unit, means for supplying current to said transmitter-receiver unit, a telephone handset to be lifted from a cradle in order to be put into service, a telephone set which is provided with a ringer and delivers a "lifted-handset" signal when said handset is removed from its cradle, a power-saving device comprising a frequency generator for producing pulses and a coupling circuit which has the function during a standby-watch state of the station of controlling the operation of the current supply means in dependence on the duration of the pulses and of permitting continuous operation of said current supply means throughout the duration of the lifted-handset signal, said coupling circuit being provided with a delay circuit for receiving the lifted-handset signal, for preventing operation of the ringer and for preventing continuous operation of the current supply means during a predetermined time interval after disappearance of said lifted-handset signal.

4,562,308

SUBSCRIBER CONNECTION CIRCUIT COMPRISING FEED RESISTORS WHICH CAN BE BRIDGED IN LOW-OHMIC FASHION AND AN INDICATION CIRCUIT WHICH EFFECTS DIFFERENT INDICATIONS

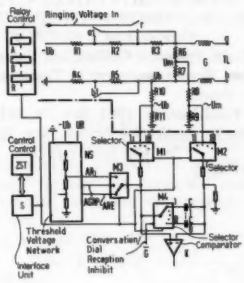
Horst Kopetzky, Unterhaching; Werner Nagler, Munich, and Walter Ossler, Germering, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 9, 1983, Ser. No. 465,118

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1982, 3207318

Int. Cl.⁴ H04Q *3/00*; H04M *3/22*

U.S. Cl. 179—18 FA **4 Claims**



1. A subscriber connection circuit arrangement for connection between a two-wire subscriber line and an exchange battery and operable to indicate the current operating mode of the subscriber line, said subscriber connection circuit arrangement comprising:

a feed resistor network including

a plurality of first resistors serially connected between a pole of the exchange battery and a first wire of the subscriber line,

a plurality of second resistors serially connected between a reference potential pole of the exchange battery and a second wire of the subscriber line,

a plurality of third resistors connected in series and and connected across the respective connections of said first and second resistors to the first and second wires of the subscriber line,

a first voltage divider connected between a pair of said third resistors and the reference potential and including an output, and

a second voltage divider connected between the connection of said third resistors to the second wire of the subscriber line and the reference potential and including an output; and

an analysis circuit including

a plurality of selectively operable relay contacts to define operating modes, including a first contact operable to shunt some of said first resistors, a second contact operable to shunt at least one of said second resistors and a third contact operable to connect a source of alternating ringing voltage to a point between the pair of said first resistors,

a rest operating mode defined by closure of none of the relay contacts providing a low feed current,

a conversation/dial reception operating mode defined by the closure of said first and second contacts providing a high feed current,

a ringing phase operating mode defined by closure of said

second and third contacts providing a ringing current superimposed on an intermediate feed current; and

a ringing interval operating mode defined by closure of said first and second contacts providing a high feed current;

a comparator including a pair of inputs connected to respective outputs of said first and second voltage dividers, and an output for providing signals representing the current operating mode,

filter means connected across said inputs and selectively operable to provide predetermined filter characteristics in said rest, ringing phase and ringing interval operating modes, and

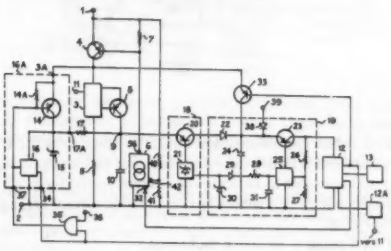
threshold value means connected to one of said inputs of said comparator and operable to selectively provide predetermined threshold signals to said comparator.

4,562,309

TELEPHONE CIRCUIT CONTROLLED BY A 2 WIRE - 4 WIRE TRANSMISSION INTEGRATED CIRCUIT MICROPROCESSOR WITH LINE CURRENT EMERGENCY SUPPLY

Michel Le Creff; Francoise Guillou, and Francois Buhagiar, all of Colombes, France, assignors to Thomson-CSF Telephone, Colombes, France

Filed Nov. 15, 1982, Ser. No. 441,619
Claims priority, application France, Nov. 20, 1981, 81 21803
Int. Cl.⁴ H04M *1/31*
U.S. Cl. 179—90 R **4 Claims**



1. A telephone circuit for pulse dialing by way of multifrequency responsive transmission circuitry, comprising:

a 2 wire-4 wire transmission integrated circuit connected in series with a switching element between a first and a second terminal,

a circuit for reducing the telephone circuit insertion voltage, when the handset is lifted, for a given duration of time, this reducing circuit being connected across the 2 wire-4 wire transmission circuit,

a telephone microprocessor circuit (**12**) connected to a keyboard and to a multifrequency generator for producing both decimal numbering pulses or multifrequency numbering signals, this microprocessor circuit being connected through a voltage stabilizing circuit, a normally (i.e. when mains present at **39**) backward biased diode (**22**), and a regulated supply circuit to said second terminal (**2**) and to a third terminal (**9**) which is itself connected through a semiconductor (**8**) controlled by the 2 wire-4 wire transmission circuit to a fourth terminal (collector of **4**) itself connected to said transmission circuit and to said switching element, said voltage regulator being connected through a diode (**38**) to an independent power supply, said regulated supply circuit comprising a reservoir capacitor,

a current generator connected between said second terminal and the output of a voltage divider connected itself between said first and second terminals, the output (**56**) of the current generator being connected to the control input of said switching element (**4**), this current generator being controlled by the decimal numbering pulses produced by said microprocessor circuit, and

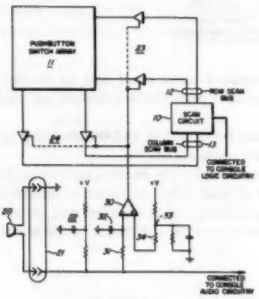
a semiconductor (**33**) connected in series with said reservoir capacitor between said forth and second terminals, and controlled by said microprocessor for turning it on shortly before the emission of a decimal numbering digit or a recall opening and turning it off shortly after this emission or this recall opening.

4,562,310

KEYBOARD SECURITY FOR A TELEPHONE ATTENDANT CONSOLE

James M. Watters, and Donald E. Clement, both of Belleville, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Mar. 29. 1984, Ser. No. 594,931
Int. Cl.⁴ H04M *1/66*
U.S. Cl. 179—100 R **3 Claims**



1. An attendant console for a telephone system comprising:

jack means for removably connecting a microphone in an attendant set to the attendant console,

a switch array for providing indications of attendant control action at the attendant console,

scan means connected to the switch array via row and column scan buses for detecting a control action occurrence,

gating means being connected in series with the row and column scan buses, and

control means being responsive to connection of the attendant set at the jack means for causing the gating means to pass electrical indication of a control action to the scan means and otherwise for causing the gating means to inhibit said electrical indication.

4,562,311

TELEPHONE NETWORK INTERFACE DEVICE

Frank P. Dola, Hudson, Fla., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 29, 1983, Ser. No. 518,575
Int. Cl.⁴ H01R *33/54*; H04M *1/00*
U.S. Cl. 179—158 R **4 Claims**

1. A network interface device for terminating network telephone wiring at a subscriber's premises and for connecting the subscriber's wiring to the network which comprises:

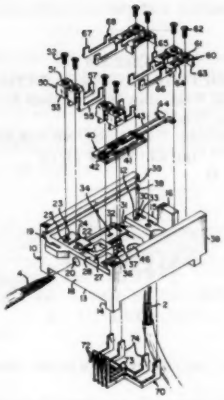
a base having a first surface, an opposed second surface, and means for mounting said base to a fixed surface so that said second surface faces said fixed surface, said base carrying on said first surface a telephone jack having a plurality of spring contacts therein,

a like plurality of first terminals upstanding from said first surface in a first row, said first terminals having means for electrically connecting to said subscriber's wiring,

a like plurality of second terminals upstanding from said first surface in said first row, said second terminals being electrically connected to said network wiring, each second terminal lying adjacent one of said first terminals to form a like plurality of first pairs,

a like plurality of third terminals upstanding from said first surface in a second row paralleling said first row, each said third terminal having means for electrically connecting to a respective second terminal, said third terminals lying opposite said respective second terminals,

a like plurality of fourth terminals upstanding from said first surface in said second row, said fourth terminals being electrically connected to said spring contacts, each fourth terminal lying adjacent one of said third terminals to form a like plurality of second pairs, said fourth terminals lying opposite respective first terminals, said second pairs lying opposite respective first pairs, said terminals in each second pair being spaced as said terminals in the opposite first pair,



a cover having a first surface and an opposed second surface facing said first surface of said base, said cover being mounted on said base for sliding movement relative thereto in a direction perpendicular to said rows, said cover carrying a like plurality of bridging contacts in a third row parallel to said first and second rows, each bridging contact sliding on a path between opposed pairs, each said bridging contact electrically connecting the terminal in a given pair, whereby,

sliding said cover relative to said base moves said bridging contacts from said first pairs to said second pairs and acts as a like plurality of single pole double throw switches, connecting said network wiring to said subscriber's wiring in one closed position and connecting said network wiring to said telephone jack in the other closed position.

4,562,312

SUBSAMPLING DELAY ESTIMATOR FOR AN ECHO CANCELER

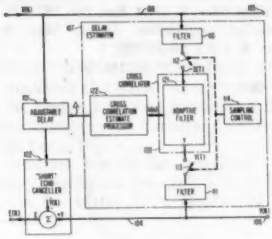
Donald L. Duttweiler, Rumson, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 17, 1983, Ser. No. 467,322
Int. Cl.⁴ G04F *10/00*; H04B *3/20*
U.S. Cl. 179—170.2 **16 Claims**

1. Apparatus for generating an estimate of delay in a delay path to which a first signal is supplied including samples obtained at a first sampling rate and from which a second signal is obtained which is a delayed version of said first signal, comprising,

means for subsampling said first signal incoming to said delay path and said second signal from said delay path,

means for obtaining a cross correlation of said subsampled first and second signals, and



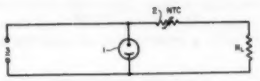
means for processing said cross correlation to generate said delay estimate.

4,562,313

ELECTRICAL SYSTEMS COMPRISING TEMPERATURE-SENSITIVE DEVICES

Andrew Tomlinson, Palo Alto, and James M. Taylor, Mountain View, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Aug. 18, 1983, Ser. No. 524,482
Int. Cl.⁴ H04M *1/24*
U.S. Cl. 179—175 **20 Claims**



1. An electrical circuit which comprises:

(1) a temperature-sensitive device which comprises one of the following:

(a) a PTC element;

(b) an NTC element;

(2) a load in series with the temperature-sensitive device; and

(3) a control device which:

(a) is in parallel with the temperature-sensitive device and the load, and

(b) has a resistance which can be interchanged between a relatively high level and a relatively low level;

the temperature-sensitive device, load and control device being connectable to a source of electrical power to form an electrical system which

(A) can adopt one of two steady states, namely:

(a) a first state in which the resistance of the control device is at said relatively high level and is substantially higher than the resistance of the temperature-sensitive device and the temperature-sensitive device is in a low resistance state, and

(b) a second state in which the resistance of the control device is at said relatively low level and is substantially lower than the resistance of the temperature-sensitive device and the temperature-sensitive device is in a high resistance state; and

(B) can be converted between the first and second states by changing at least one of the following: (i) the power source in the system, and (ii) the physical environment of the control device.

4,562,314

X-Y POSITIONS INPUT DEVICE FOR DISPLAY SYSTEM

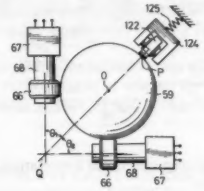
Junichi Hosogoe; Motoyuki Suzuki, and Yuichi Ida, all of Miyagi, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Mar. 8, 1984, Ser. No. 587,409

Claims priority, application Japan, Mar. 9, 1983, 58-32769[U]; Mar. 9, 1983, 58-32770[U]

Int. Cl.⁴ H01H *9/00*

U.S. Cl. 200—5 R **4 Claims**



1. An X-Y input device comprising a rotatable ball, a first driven roller held in contact with said rotatable ball and rotatable in response to rotation of said rotatable ball, a second driven roller held in contact with said rotatable ball and rotatable in response to rotation of said rotatable ball, said second driven roller having an axis of rotation extending substantially perpendicularly to that of said first driven roller, first rotation detector means for detecting an amount of rotation of said first driven roller, and second rotation detector means for detecting an amount of rotation of said second driven roller, each of said rotation detector means comprising a pattern base plate including a central pattern and a peripheral pattern concentric with said central pattern, a slider having a first contact end held in slidable contact with said central pattern and a second contact end held in slidable contact with said peripheral pattern, and a slider support supporting said slider and connected to each of said driven rollers for rotation therewith, said first contact end of said slider being held in contact with said central pattern at a point aligned with a central axis of rotation of said driven roller.

4,562,315

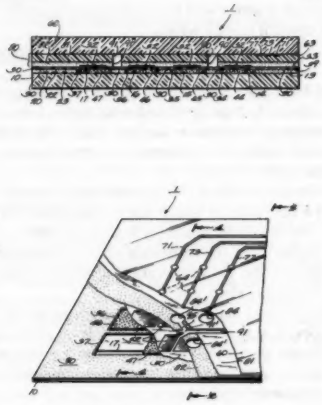
CAPACITANCE MEMBRANE SWITCH

Brian E. Aufderheide, Cedarburg, Wis., assignor to W. H. Brady Co., Milwaukee, Wis.

Filed Sep. 20, 1984, Ser. No. 652,802

Int. Cl.⁴ H03K *17/96*

U.S. Cl. 200—5 A **4 Claims**



1. In a capacitance membrane switch of the type including (1) a fixed capacitor defined by a dielectric film layer having an upper surface and a lower surface, a capacitor plate on the upper surface of the dielectric film layer and a capacitor plate on the lower surface of the dielectric film layer, and (2) a second layer spaced from the dielectric film layer and having an upper surface facing the lower surface of the dielectric film layer, with a conductive pattern on the upper surface of the second layer,

the improvement wherein: the capacitor plate on the lower surface of the dielectric film layer consists of conductive adhesive bonded to the dielectric film layer on the lower surface thereof opposite from the capacitor plate on the upper surface of the dielectric film layer to thereby form a fixed capacitor, the conductive adhesive also being bonded to the upper surface of the second layer to form an electrical interface with the conductive pattern thereon.

4,562,316

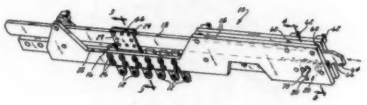
HIGH VOLTAGE LINEAR TAP CHANGER

Neil J. Kranich, II, West Allis, Wis., assignor to ASEA Electric, Inc., Waukesha, Wis.

Filed Jun. 7, 1984, Ser. No. 618,265

Int. Cl.⁴ H01H *15/16*

U.S. Cl. 200—16 D **11 Claims**



8. A linear type tap changer for a power transformer comprising

a number of flat electrically conductive members adapted to be connected to the transformer,

dielectric means for supporting said conductive members in a linear relation at equally spaced intervals,

linearly movable contact means mounted on said dielectric supporting means and including louvered contacts for movement into electrical engagement with said electrically conductive members,

and means for moving said contact means in a step by step manner through steps of equal distance whereby said contact means will positively engage two electrical contact members after each step of motion.

4,562,317

AUTOMOTIVE-TYPE DISTRIBUTOR ROTOR WITH BUILT-IN SUPPRESSOR RESISTOR

Richard Gerber, Stuttgart, and Dieter Trautwein, Markgröningen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 30, 1984, Ser. No. 635,530

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1983, 3333892

Int. Cl.⁴ F02P *7/10;* **H01C** *13/00;* **H01H** *19/00*

U.S. Cl. 200—19 DR **6 Claims**

1. Suppressor-type distributor rotor, for use in a distributor to distribute spark energy to multiple spark plugs of an internal combustion engine, having

a rotor body (6) defining a central hub, including a central terminal (4) secured thereto;

a distribution terminal portion having a metallic terminal (1) thereon; and

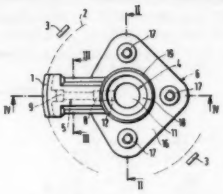
a radially extending connecting portion, connecting the terminal portion to the central hub, including a noise suppression resistor (5) electrically connecting the central terminal (4) and the metallic distribution terminal (1),

wherein, in accordance with the invention,

said resistor (5) has terminal caps (8, 9) securely attached to its end portions;

the central terminal (4) and the metallic distribution terminal (1) are, each, connected to a respective end of the suppressor resistor (5) and form together a unitary subassembly;

the rotor body (6) is a plastic injection-molded part, said



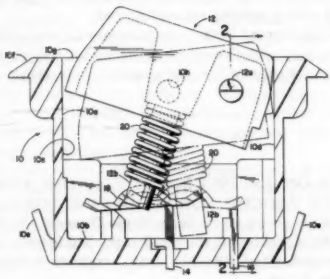
central terminal (4)—resistor (5)—metallic distribution terminal (1) subassembly being integrally molded therein; and the central terminal (4) comprises a contact plate (11), and a contact strip (12) extending radially therefrom, in essentially the same plane as the plane of the plate (11), and having a bent-up free end which is secured to one end terminal of the resistor (5).

4,562,318

MOMENTARY SWITCH

Richard W. Sorenson, Avon, Conn., assignor to Carlingswitch, Inc., West Hartford, Conn.

Filed Apr. 6, 1984, Ser. No. 597,442
Int. Cl.⁴ H01M *5/08*
U.S. Cl. 200—73 **10 Claims**



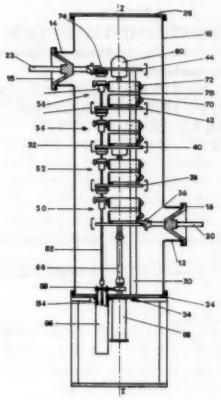
1. A momentary switch comprising a switch case having side, end and bottom walls defining an upwardly open cavity of generally rectangular configuration, fixed contacts provided in horizontally spaced relationship in said switch case bottom wall, one of said fixed contacts having an upper end defining a fulcrum, a floating contact slidably and pivotably received on said fixed contact fulcrum, an actuator pivotably mounted in said switch case cavity for movement between opposed first and second limit positions, coupling means between said actuator and said floating contact to cause movement of the latter in response to pivotal movement of the actuator so that said floating contact is shifted between first and second limit positions corresponding to said first and second actuator limit positions respectively, said coupling means including lost motion means acting between predetermined regions of said floating contact and of said actuator so that said floating contact and actuator pivot oppositely relative to one another, said lost motion means including a compression spring acting between said predetermined regions of said actuator means and said floating contact, said actuator being pivotably supported in said switch case for movement relative to an actuator pivot axis, said actuator axis being offset from said fulcrum for said floating contact and provided vertically above another of said fixed contacts so that said actuator and floating contact are biased toward one of said opposed limit positions by said spring to provide a momentary switch action in the other of said opposed limit positions.

4,562,319

METAL-CLAD PUFFER-TYPE CIRCUIT-BREAKER HAVING CLOSING RESISTORS

Aimé Badon, St. Ismier; Jean-Yves Berthonnier, St. Martin-le-Vinoux, and Claude Mounier, Grenoble, all of France, assignors to Merlin Gerin, France

Filed Jun. 4, 1980, Ser. No. 156,477
Claims priority, application France, Jun. 6, 1979, 79 14666
Int. Cl.⁴ H01H *33/16, 33/89, 9/42*
U.S. Cl. 200—144 AP **7 Claims**



1. A multibreaker arc-extinguishing pole unit for a high-voltage metal-clad puffer type circuit breaker, comprising:

a grounded metal enclosure of substantially cylindrical shape adapted to contain a compressed arc-extinguishing gas of high dielectric strength;

a plurality of electrically series-connected arc-extinguishing units spaced apart in said enclosure in the longitudinal direction thereof, each unit having a pair of elongated separable main contact means extending parallel to said longitudinal direction to draw an arc therebetween, and a puffer mechanism coaxial with said main contact means and adapted to draw gas from the inside of said enclosure to direct a blast of compressed gas on said arc, said main contact means comprising a relatively stationary contact and a movable contact;

support beam means extending in said longitudinal direction within said enclosure;

a plurality of transverse partition plates extending perpendicularly to said longitudinal direction and secured to said support beam means at regular intervals to define a number of sections therebetween corresponding to the number of arc-extinguishing units;

main control rod means extending in said enclosure parallel to said longitudinal direction to actuate said movable contact;

said main contact means and said puffer mechanisms of the arc-extinguishing units being arranged in staggered fashion such that units of odd rank are aligned along a first axis and said main contact means and said puffer mechanisms of the arc-extinguishing units of even rank are aligned along a second axis, said axes extending parallel to said longitudinal direction symmetrically with respect to the axis of said cylindrical enclosure;

said transverse plates supporting said units in such a manner that in all sections but the first the corresponding arc-extinguishing unit is juxtaposed to the unit of next-higher rank so that said units overlap each other laterally thereby reducing the overall length of the assembled units of the pole;

a series-connected resistor and auxiliary interrupter means inserted in each of said sections between two successive partition plates, each resistor comprising two series connected elongated resistor elements extending crosswise to said longitudinal direction and being superposed in said longitudinal direction, the auxiliary interrupter means being all coaxial, and

ar. auxiliary control rod for actuating all of said auxiliary interrupter means, said auxiliary control rod extending in said longitudinal direction within said enclosure.

4,562,320

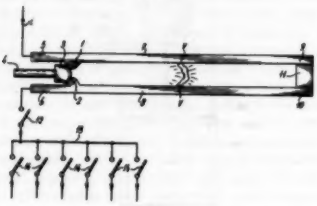
CURRENT-LIMITING DEVICE

Derk van der Scheer, Goor, Netherlands, assignor to Hazemeijer B.V., Hengelo, Netherlands

Continuation of Ser. No. 818,330, Jul. 22, 1977. This application Dec. 15, 1980, Ser. No. 216,498

Int. Cl.⁴ H01H *33/00, 9/30*

U.S. Cl. 200—144 R **6 Claims**



1. A device for limiting electric current in a current interruption device, comprising:

two stationary contacts including terminal means and a bridging contact movable toward and away from a position bridging said stationary contacts;

a conductor connected to each of said stationary contacts;

said bridging contact moving away from said bridging position at a value of the current flowing through said conductors such that upon interruption of the current therethrough the voltage across said stationary contacts is sufficient to generate an arc therebetween, said arc traveling along said conductors away from said stationary contacts by the magnetic field generated from the current flowing through said conductors; and

means interconnecting the ends of said conductors remote from said stationary contacts to provide a parallel current path for said arc, and including means for interrupting said current from the terminal means to said arc.

4,562,321

GUIDING ASSEMBLY FOR A HIGH-VOLTAGE CIRCUIT-BREAKER OPERATING ROD

Roger Bolongeat-Mobleu, Echirolles; Thierry Busin, and Jean-Paul Ravet, both of Grenoble, all of France, assignors to Merlin Gerin, Grenoble, France

Filed Oct. 15, 1984, Ser. No. 660,878

Claims priority, application France, Oct. 24, 1983, 83 17036

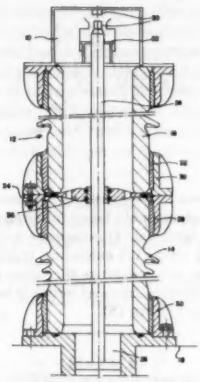
Int. Cl.⁴ H01H *33/88*

U.S. Cl. 200—148 A **4 Claims**

1. A high-voltage circuit-breaker operating device having a mechanism in a zone of ground potential and an arc-extinguishing chamber, notably an arc puffer device, in the high-voltage potential area, comprising:

a hollow support insulator in several superimposed sections, each section comprising a cylindrical porcelain body and flanges in the form of clamps, sealed to the ends of the sections and slightly protruding from the latter, the clamps of two adjacent sections being mounted end to end and secured by bolts, an annular gap being left between the ends of the porcelain bodies facing each other,

an insulating operating rod which extends coaxially inside



the hollow insulator to transmit movement from the operating mechanism to the arc-extinguishing chamber,

an insulating disc having an external edge inserted with a small amount of clearance in said annular gap and a central orifice guiding the sliding rod,

an O-ring housed in said gap to ensure tightness between the sections, said O-ring circumferentially surrounding the external edge of the disc to position the latter.

4,562,322

SF_6 GAS ARC EXTINGUISHING ELECTRIC APPARATUS AND PROCESS FOR PRODUCING THE SAME

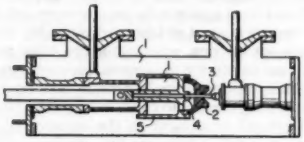
Motoo Yamaguchi; Isamu Sone; Kunio Hirasawa; Yoshio Yoshioka; Akio Nishikawa; Hiroshi Suzuki; Mikio Sato, and Masao Hosokawa, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 383,183, May 28, 1982, abandoned. This application Dec. 18, 1984, Ser. No. 682,947

Claims priority, application Japan, Jun. 3, 1981, 56-86240

Int. Cl.⁴ H01H *33/82*

U.S. Cl. 200—148 G **19 Claims**



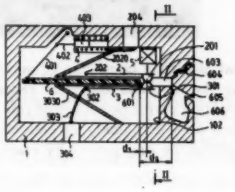
1. In a SF_6 gas arc extinguishing electric apparatus containing an SF_6 arc extinguishing gas and a resin insulator, both of which are present in an atmosphere to be exposed to arcs, the improvement wherein at least the surface portion to be exposed to arcs of said resin insulator is made from a mixture of a polymer containing nitrogen atoms and a polyolefin resin, whereby said polymer containing nitrogen atoms improves the surface arc resistance and inner arc resistance of said polyolefin resin.

4,562,323

SWITCH DEVICE HAVING AN INSULATING SCREEN INSERTED BETWEEN THE CONTACTS DURING BREAKING AND MEANS FOR SHEARING THE ARC BETWEEN THIS SCREEN AND AN INSULATING WALL

Elie Belbel, Epinay; Christian Blanchard, Nanterre; André Haury, Le Raincy, and Michel Lauraire, Courbevoie, all of France, assignors to La Telemecanique Electrique, France

Filed Feb. 3, 1984, Ser. No. 576,983
Claims priority, application France, Feb. 4, 1983, 83 01749
Int. Cl.⁴ H01H *33/06*
U.S. Cl. 200—151 **13 Claims**



1. A switch comprising:

a housing made of dielectric material;

a pair of electrical contacts mounted within the housing wherein at least the first one of the contacts is mounted for movement between open and closed positions with respect to the second contact;

first means for moving said first contact from said closed to said open position;

a screen made of dielectric material said screen having a forward surface portion adapted for engagement with a cooperating surface portion located within the housing;

means mounting the said screen within the housing for movement from a first position in which the said forward surface portion is located on this side of the first contact to a second intermediate position in which the said forward surface portion is located facing the second contact and a third position in which the said forward surface portion is beyond the second contact, in engagement with the said cooperation surface portion;

and second means, physically independent of said first means, for propelling the said screen from the first to the second position thereof at a speed between 2 m/s and 20 m/s simultaneously with the movement of the said contact from closed to open position, but independently of said movement, the contacts being separate from each other to allow the free passage of the said screen when the said screen reaches the said second position.

4,562,324

ELECTRICAL CONTACT FOR USE IN A CURRENT-INTERRUPTING UNIT

Walter J. Hall, and Raymond P. O'Leary, both of Evanston, Ill., assignors to S&C Electric Company, Chicago, Ill.

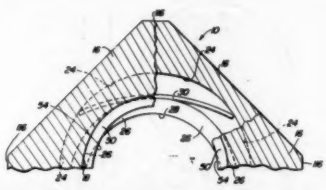
Continuation of Ser. No. 415,761, Sep. 7, 1982, abandoned. This application Mar. 29, 1984, Ser. No. 594,714
Int. Cl.⁴ H01H *1/44*
U.S. Cl. 200—260 **21 Claims**

1. A current interrupting unit having a first electrical contact and a second electrical contact, the contacts being relatively movable to engage and disengage; wherein the first electrical contact comprises:

a body having a bore, the second contact being receivable in, and freely movable along a path through, the bore as relative contact movement takes place, the wall of the bore containing a groove;

a pressure ring held in the groove for limited shifting therein transversely of the bore and of the path of the second contact, the pressure ring having an aperture which is alignable with the path of the second contact, due to the shiftability of the pressure ring, to closely receive the second contact for movement therethrough as relative contact movement takes place; and

unidirectional bias means in the groove for normally biasing the entire pressure ring transversely of the bore in the same linear direction both to normally position at least a portion of the pressure ring in the path of the second contact and to normally effect axial misalignment between the aperture and the path of the second contact, entry of



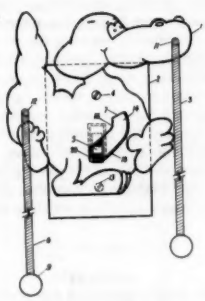
the second contact into the aperture shifting the pressure ring against the action of the biasing means to substantially axially align the aperture with the path of the second contact, such axial alignment and the action of the biasing means thereafter effecting intimate sliding engagement between the wall of the aperture and the second contact and between at least a portion of the wall of the bore and the second contact as long as the second contact is within the aperture.

4,562,325

DECORATABLE WALL SWITCH ACTUATOR

Keith J. De Rouen, 100 Amy St., New Iberia, La. 70560

Filed Dec. 14, 1983, Ser. No. 561,543
Int. Cl.⁴ H01H *17/30*
U.S. Cl. 200—331 **2 Claims**



1. An apparatus for operating a wall mounted electrical switch having a wall mount plate with upper and lower points of attachment to the switch and a switch handle movable from a first switching position to a second switching position, comprising:

a. a plaque pivotally mounted about the upper point of attachment of the wall mount plate to the switch, the plaque being provided with an elongated slanted slot having upper and lower portions, wherein the distance between the pivot point and upper slot portion is less than the distance between the pivot point and the lower slot portion;

b. a first pull cord means for pivoting said plaque from said first to said second switching position; and

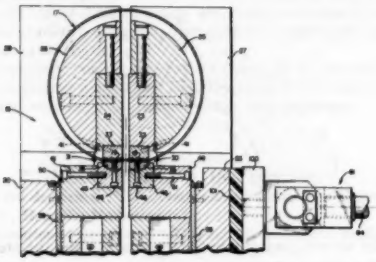
c. a second pull cord means for pivoting said plaque from said second to said first switching position.

4,562,326

MACHINE FOR WELDING AUTOMOTIVE WHEEL RIM BLANKS

Archie Tan, Wilmette, and Vernon R. Fencl, Northbrook, both of Ill., assignors to Grotnes Metalforming Systems, Inc., Chicago, Ill.

Filed Mar. 27, 1984, Ser. No. 593,806
Int. Cl.⁴ B23K *11/02*
U.S. Cl. 219—59.1 **17 Claims**



1. A welding machine for welding the longitudinal seam of a wheel rim blank which has been rolled into a cylinder, the longitudinal edges of the blank forming the weld zone for the longitudinal seam, said machine having first and second clamping assemblies on laterally opposite sides of said weld zone and each including an inside clamping member and an outside clamping member for engaging the inner and outer surfaces, respectively, of the rim blank adjacent said weld zone, the inside member of each clamping assembly being substantially fixed against movement radially of the rim blank, a pair of mounting means each mounting the outside member of a respective clamping assembly for linear movement of that outside member independently of the other outside member and radially of the rim blank between open and closed positions with respect to the inside member of the clamping assembly, means supporting the clamping members of said first clamping assembly for lateral pivoting toward and away from the clamping members of said second clamping assembly, a pair of moving means each for linearly moving the outside member of a respective clamping assembly independently of the other to said closed position after a rim blank has been placed between the inside and outside members, means for thereafter pivoting the means supporting the clamping members of said first assembly laterally toward the clamping members of said second assembly to press the longitudinal edges of the rim blank against one another, and means for passing an electric welding current through said clamping assemblies and the longitudinal edges of the rim blank to effect welding of the longitudinal edges.

4,562,327

PISTON AND PROCESS OF PROVIDING WEAR-RESISTING SURFACES IN THE RING GROOVES OF AN ALUMINUM ALLOY COMBUSTION ENGINE PISTON

Siegfried Mielke, Neckarsulm, Fed. Rep. of Germany, assignor to Karl Schmidt GmbH, Neckarsulm, Fed. Rep. of Germany

Filed Dec. 12, 1983, Ser. No. 560,779
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1982, 3246630; Nov. 4, 1983, 3339867
Int. Cl.⁴ B23K *9/04*
U.S. Cl. 219—76.11 **14 Claims**

1. In a process of providing wear-resistant surfaces in at least the uppermost ring groove in an aluminum alloy internal combustion engine piston by arc welding, the improvement comprising: forming a groove in a piston blank in at least one region to be provided with a ring groove by machining, rotating the piston blank about its longitudinal axis and during rotation, entirely filling the groove by arc welding with a filler material which comprises a silicon-containing aluminum alloy, wherein the step of filling the groove machined into the piston blank comprises filling same with a hard alloy by fusing the surface of the piston material and fusing down an electrode consisting of the silicon-containing aluminum alloy and at least

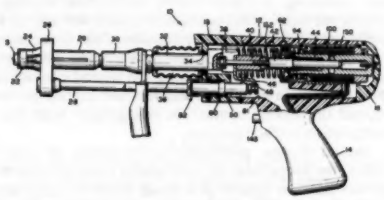
one additional electrode consisting of another filler material for increasing the hardness and wear resistance at the same time by arc welding performed at a high rate of travel, solidifying the molten pool as quickly as possible by cooling, and thereafter forming the ring groove by machining.

4,562,328

STUD WELDING TOOL

Thomas E. Shoup, Amherst, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed Sep. 10, 1984, Ser. No. 648,684
Int. Cl.⁴ B23K *9/20*
U.S. Cl. 219—98 **18 Claims**

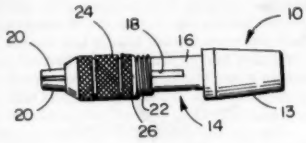


1. A stud welding tool comprising a tool body forming an interior chamber, said body having a front cover closing off a front portion of said chamber, said cover having a front opening and a lower chamber, a chuck assembly comprising a chuck leg extending through said front opening, a lifting rod in said interior chamber, and connecting means connecting said chuck leg and said lifting rod, a dampening unit movably carried by said lower chamber and having an end extending toward said interior chamber, said unit having a cylinder, a piston in said cylinder, and a piston rod connected to said piston and extending beyond said end of said unit further toward said interior chamber, said piston rod having a collar thereon with spaced apart flanges, a plunge dampener tang rigidly carried by said chuck assembly and having an end extending between said flanges, with the thickness of said tang being less than the space between said flanges, said body forming an intermediate bore in said interior chamber through which said lifting rod extends, a lift mechanism housing in said bore, a core through which said lifting rod extends, a lifting hook in said housing connected to said core, a lifting ring in said housing through which said lifting rod extends, said ring being engageable by said hook to move said lifting rod when said core is moved, a stop plate in said housing adjacent said lifting ring, and a coil spring in said housing engaging said lifting ring and urging said lifting ring toward said stop plate.

4,562,329
VARIABLE STUD WELDING CHUCK

Thomas C. Minton, Paramount, Calif., assignor to Lewis M. Malicoat, Trustee, Escondido, Calif.

Filed Aug. 17, 1984, Ser. No. 641,731
Int. Cl.[4] B23K *9/20*
U.S. Cl. 219—99 13 Claims

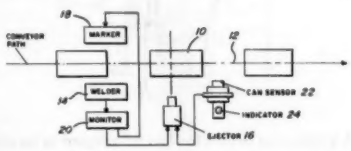


1. In a process for stud welding employing a machine for sequentially receiving cylindrical metal workpieces of different diameters and for sequentially positioning said workpieces in juxtaposition against metal surfaces and for passing an electric current through each of said workpieces and said metal surfaces to weld said metal workpieces thereto, the improvement comprising employing with said machine a stud welding chuck defining a workpiece receiving orifice of selectively variable diameter in which said chuck has a barrel formed with an annular externally threaded wall in which longitudinal slots are defined extended from said workpiece receiving orifice to delineate a plurality of resilient fingers an in which an annular collet encircles said barrel and is interiorally threaded with threads which engage with said threads on said barrel wall in a conflicting manner, and varying the diameter of said workpiece receiving orifice by longitudinally adjusting the position of said collet along said barrel so that said collet bears radially inwardly against said externally threaded annular barrel wall at a tapered interface therewith so that said fingers selectively vary the diameter of said workpiece receiving orifice so as to snugly receive workpieces of a selected diameter.

4,562,330
SPOT WELD QUALITY MONITORING SYSTEM

Rodrick J. Hamilton, Whitesboro, N.Y., assignor to Digimetrics, Inc., Yorkville, N.Y.

Filed Sep. 9, 1983, Ser. No. 530,754
Int. Cl.[4] B23K *11/24*
U.S. Cl. 219—110 14 Claims

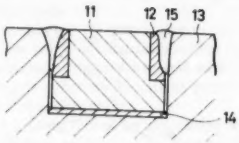


1. (Amended) In combination with apparatus for welding a seam on a product during movement along a conveyor path by applying electrical energy from an AC source across welding electrodes, a method of evaluating weld quality including the steps of: measuring a fractional portion of said applied electrical energy consumed each half cycle of said AC source to heat weld nuggets during said movement of the product along the conveyor path; cyclically detecting levels of the measured energy in excess of preset limits; and generating a reject signal in response to detection of said excessive levels during at least two consecutive half cycles.

4,562,331
METHOD OF JOINING MEMBERS DIFFICULT TO FUSION WELD

Akihiko Motoo, Hiroshima, Japan, assignor to The Japan Steel Works, Ltd., Tokyo, Japan

Filed Jul. 8, 1983, Ser. No. 512,056
Int. Cl.[4] B23K *15/00*
U.S. Cl. 219—121 ED 5 Claims



1. A method of joining a member (A), which is difficult to fusion-weld, to another member (B), comprising:

(a) fitting an insert ring made of a material fusion-weldable to the member (B) onto the member (A) by the application of pressure;

(b) placing the member (A) with the insert ring fitted thereon in a predetermined position of the member (B) with a solder material interposed therebetween;

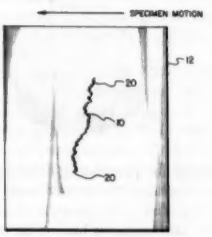
(c) joining the insert ring to the member (B) by high energy welding; and

(d) melting the solder material by heating the member (B), thereby soldering the member (A) to the member (B).

4,562,332
SURFACE CRACK HEALING WITH HIGH-ENERGY BEAM

Robert J. Walter, Thousand Oaks; Jack R. Lewis, Granada Hills, both of Calif., and Charles M. Moss, Ra'anana, Israel, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 26, 1984, Ser. No. 593,066
Int. Cl.[4] B23K *15/00*
U.S. Cl. 219—121 EM 10 Claims



1. A method for healing surface cracks in a meltable material comprising the steps of:

directing a diffused beam of high-energy at the edge of a surface crack in a meltable material, the energy of said beam being sufficient to melt the edges of the crack at its surface so that the edges will fuse together;

oscillating said beam from one end of the crack to the other; and

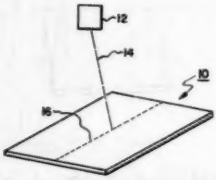
moving said material at a slow rate laterally with respect to the direction of oscillation of said beam, wherein the level of energy applied to said material is insufficient to produce enough thermal shock to increase the crack width.

4,562,333

STRESS ASSISTED CUTTING OF HIGH TEMPERATURE EMBRITTLED MATERIALS

Alan I. Taub, Schenectady; Peter G. Frischmann, Scotia, and Harvey E. Cline, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 4, 1984, Ser. No. 647,207
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LJ 5 Claims



1. A method for severing a normally ductile article which exhibits a hot-short phenomena and which has at least one small dimension which comprises

heating the article along a seam at which severance is to occur to a temperature which imparts hot short properties to the material of the seam,

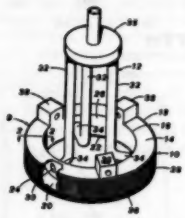
applying force to the seam while the material of said seam is in the hot short condition to cause a separation of the material into parts due to fracture of the hot short material of the seam while at the hot short temperature.

4,562,334

GAS SHIELDING APPARATUS

Daniel Brandt, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 5, 1984, Ser. No. 617,652
Int. Cl.[4] B23K *9/16*
U.S. Cl. 219—74 7 Claims



1. An apparatus for preventing oxidation by uniformly distributing inert shielding gas over a weld area of workpieces being welded together, said apparatus comprising:

a. a chamber, said chamber having an annular top wall with inside and outside edges, an annular bottom wall with inside and outside edges, an inner side wall disposed between and connecting said inside edges of said top and bottom walls and an outer side wall disposed between and connecting said outside edges of said top and bottom walls, said outer side wall comprising a screen, said inner side wall having a portion defining an orifice; and

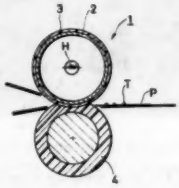
b. gas introduction means for introducing inert gas into said chamber, said gas introduction means being in fluid communication with said chamber and having a portion which encloses said orifice, so that gas introduced into said chamber leaves said chamber through said outer side wall and is dispersed evenly over the weld area of the workpieces being welded together.

4,562,335

THERMAL FIXING ROLL FOR ELECTROGRAPHIC PROCESSING

Ryuji Katsuno, and Toshihiko Tsuda, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jan. 9, 1984, Ser. No. 569,139
Claims priority, application Japan, Jan. 7, 1983, 58-434
Int. Cl.[4] G03G *15/20*
U.S. Cl. 219—216 7 Claims



1. An electrographic processing thermal fixing roll, comprising:

a cylindrical core (2); and

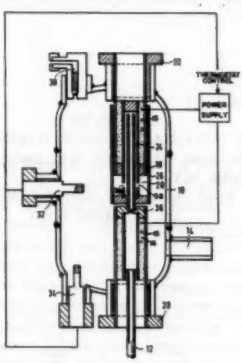
a heat-resistant elastic layer (3) substantially covering an outer cylindrical surface of said core, said layer comprising a mixture of silicone rubber and silicon carbide.

4,562,336

PREHEATING DEVICE

Horst Heimler, Heidelberger Str. 77, 6100 Darmstadt, Fed. Rep. of Germany

Filed Feb. 3, 1984, Ser. No. 576,901
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1983, 8302976[U]
Int. Cl.[4] H05B *1/00*
U.S. Cl. 219—282 7 Claims



1. A preheating device for fuel oil adapted to be attached to a furnace between a furnace oil pump and a furnace burner, said preheating device including at least two heating cartridges each having electrical heating means through which fuel oil is adapted to flow when said device is installed between said oil pump and said burner, said preheating device comprising:

(a) a first pressure-proof chamber having an inlet for receiving oil to be preheated;

(b) a first heating cartridge positioned within said chamber, said first heating cartridge having a central passage and being directly fluidically connected to said inlet;

(c) a second heating cartridge adjacent said first heating cartridge, said second heating cartridge having an outer wall and being positioned within a generally cup-shaped

vessel, said vessel having a bottom and said second heating cartridge having a front surface, a second pressure chamber being located between said vessel bottom and said second heating cartridge front surface, a substantially narrow angular gap being located along the length of said second heating cartridge and being formed between said outer wall of said second heating cartridge and an inner surface of said cup-shaped vessel, said second heating cartridge including a central passage, said central passage being closed at one end of said second cartridge and open at a second end of said second cartridge, said second end being located adjacent said second pressure chamber;

(d) an immersion pipe extending from a central passage of said first heating cartridge to an area adjacent said closed end of said second heating cartridge, said immersion pipe extending through said vessel bottom; and

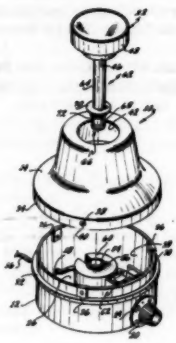
(e) a conduit extending outwardly from said first pressure-proof chamber, said conduit adapted to conduct fuel oil from said chamber to said furnace burner when said device is attached to said furnace.

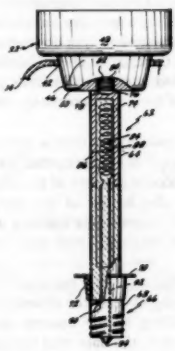
4,562,337

SOLDER POT

William Lawrence, Palos Verdes Estates, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.

Filed May 30, 1984, Ser. No. 615,388
Int. Cl.⁴ F27B *14/06*
U.S. Cl. 219—421 **21 Claims**





1. An electrical soldering pot which comprises:

a hollow base having a bottom wall and a continuous side wall extending upwardly from said bottom wall;

a hollow housing member attaching to the upper periphery of said side wall of said base, said housing member extending from said side wall of said base upward to an upper terminus, said upper terminus including an opening located therein;

an electrical socket means located on the inside of said bottom wall of said base within said hollow interior of said base;

an electrical control means located on said base, said electrical control means electrically connected to said electrical socket means for controlling power supplied to said electrical socket means;

means for supplying electrical power to said electrical socket means and said electrical control means, said latter means electrically connected to said socket means and said control means whereby electrical power is supplied to said electrical socket means;

an elongated heating means for generating heat, said heating means including an outer tube having first and second ends, a socket connector means located at said first end of said tube;

said heating means further including an elongated metallic thermal conducting member having a cavity end and a connecting end, said thermal conducting member of a shorter elongated dimension than said tube, said thermal conducting member located in said tube with said connecting end positioned at said second end of said tube and said cavity end located between said first and said second ends of said tube, said thermal conducting member including a container connector located at said connecting end and positioned so as to extend out of and be exposed out of the second end of said tube, said thermal conducting member including a cavity means, said cavity means having an opening at least a part of which is located at said cavity end of said thermal conducting member;

said heating mean further including a monolithic burnt ceramic element having an electrical resistance means integrally formed within the interior of said ceramic element and first and second electrical connectors leading from said resistance means to the exterior of said ceramic element, said ceramic element sized and shaped so as at least a part of said ceramic element fits within said cavity within said thermal conducting member in an intimate relationship with said thermal conducting member so as to allow heat to transfer from said ceramic element to said thermal conducting member, said first and said second electrical connectors electrically connected to said socket connector means;

said socket connector means on said heating means mating with said electrical socket means on said base to physically and electrically connect said heating means to said electrical socket means;

a solder container having an upwardly extending opening, said solder container attaching to said heating means container connector so as to physically hold said solder container on said heating means and to thermally connect said thermal conducting member to said heating means so as to allow heat transfer from said thermal conducting member to said solder container.

4,562,338

HEATING POWER SUPPLY APPARATUS FOR POLYCRYSTALLINE SEMICONDUCTOR RODS

Seiichi Okami, Hyogo, Japan, assignor to Osaka Titanium Co., Ltd., Hyogo, Japan

Filed Jul. 15, 1983, Ser. No. 514,271
Int. Cl.⁴ H05B *1/02*
U.S. Cl. 219—503 **3 Claims**

1. A heating power supply apparatus for manufacturing polycrystalline semiconductor rods, comprising:

a power transformer having a primary winding and a secondary winding, said secondary winding having plural portions;

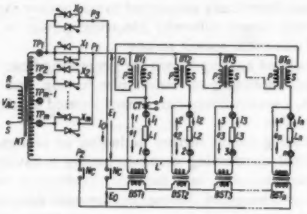
anti-parallel thyristor unit groups having input terminals connected to respective portions of the secondary wind-

ing of said power transformer and having commonly connectd output terminals;

at least a first group of plural balance transformers having respective primary and secondary windings, said balance transformer primary windings connected to said anti-parallel thyristor group output terminals;

semiconductor rod connecting terminals connected to respective of said rods and to the secondary windings of said first group of balance transformers;

wherein the secondary winding of each balance transformer is connected in series with the primary winding of a different balance transformer and in series with respective of said semiconductor rod connecting terminals so that a constant secondary current flows in each of said balance transformer and in each of said semiconductor rods;



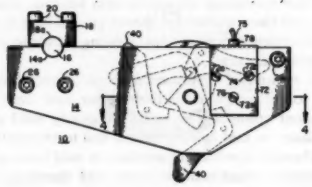
feedback control means for detecting the secondary current in said secondary windings of said first group of balance transformers and for selecting at least one of said anti-parallel thyristor unit groups to drive said first group of balance transformers such that said secondary current is maintained within a predetermined range during manufacture of said rods to a predetermined size.

4,562,339

INSERTED PRODUCT NEWSPAPER SENSOR

Christer A. Sjogren, Miami; John McRae, Pembroke Pines, and Carlos Reyes, Miami, all of Fla., assignors to Quipp, Incorporated, Hialeah, Fla.

Filed May 11, 1984, Ser. No. 609,448
Int. Cl.[4] G06M 7/06
U.S. Cl. 235—98 R **27 Claims**



1. Apparatus for sensing and counting a moving stream of signatures and the like and especially signatures having misfed and/or improperly positioned inserts, said apparatus comprising;

a housing;

said housing having an opening facing said signature stream;

a member rotatably mounted in and contained within said housing and adjacent to the path of movement of signatures, said signatures moving along said path in overlapping fashion with the folded edge of the signatures comprising the leading edge thereof;

a plurality of fingers each being swingably mounted upon said rotatably mounted member at spaced intervals therealong for rotating said rotatably mounted member in a first direction when the finger is engaged and moved by the nose of a signature to move the finger away from the signature stream and to bring the next finger into sliding engagement with the signature stream;

said fingers being normally resiliently biased to sequentially extend in a first direction outwardly through said opening and toward said signature stream to slidably engage the adjacent surface of a passing signature;

a cam rotatable with said rotatable member and having a cam surface;

a movable detent member having a cam follower surface slideably engaging said cam surface;

resilient bias means normally urging said detent member into engagement with said cam surface;

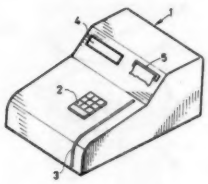
said cam surface having a plurality of detents each selectively engaged by said cam follower to substantially limit rotation of the rotatably mounted member, and having a decelerating cam surface portion cooperating with the follower member for decelerating the rotatably mounted member when the rotatably mounted member rotates to move the detent member away from a detent in the cam follower surface.

4,562,340

TERMINAL DEVICE FOR MAKING PAYMENTS FOR CREDIT TRANSACTIONS

Kazuma Tateisi, Ukyo, and Yoshitsugu Shinohara, Shiga, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Oct. 18, 1983, Ser. No. 543,012
Claims priority, application Japan, Oct. 19, 1982, 57-183883
Int. Cl.[4] G06F 15/30
U.S. Cl. 235—379 **7 Claims**



1. A terminal device for making payments for credit transactions which is connected to and adapted to communicate with a control center including a memory having stored therein data as to a plurality of users and as to a deposit account of at least one credit company, the control center having the function of transferring a specified sum payable from an account of the user to the account of the credit company, the terminal device comprising:

a card reader for reading data from a credit card and a bank card, the credit card having recorded therein data relating at least to the account number of the credit company and data relating to the holder of the card, the bank card having recorded therein data relating at least to the account number of its holder and data for identifying the holder,

input means for entering a sum payable,

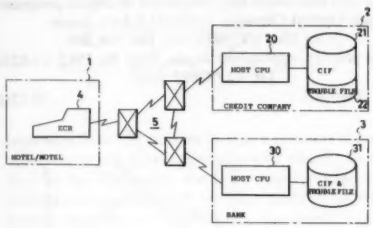
a display for showing at least the entered sum payable,

means for transmitting to the control center at least the entered sum payable, the data read by the card reader and relating to the account number of the credit company and the data read by the card reader and relating to the account number of the holder of the bank card, and a recorder for recording data as to transfer processing upon receiving from the control center a message indicating completion of the transfer processing.

4,562,341
ELECTRONIC CASH REGISTER

Kenichi Ohmae, Yokohama; Kazuma Tateisi, Kyoto; Yoshitsugu Shinohara, and Masazumi Ichihashi, both of Shiga, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Feb. 15, 1984, Ser. No. 580,448
Claims priority, application Japan, Feb. 18, 1983, 58-26733
Int. Cl.⁴ G06F *15/30*
U.S. Cl. 235—379 **13 Claims**

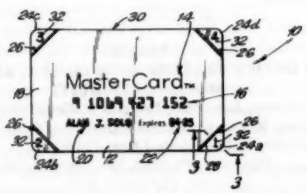


1. An electronic cash register comprising:
a keyboard having keys for cash registration and for initiating customer credit inquiries,
means for performing cash registration processing,
a card reader for reading data recorded in a customer card,
a communication control unit for communicating with a center provided with a customer file having stored therein at least data relating to the credit standing of a plurality of customers,
a device for converting data relating to the credit standing of a selected customer sent from the center to visible information,
a memory for storing data as to cash registration and data as to credit inquiries, and
a control unit responsive to keyboard entries for processing cash registration, controlling transmission of the data read from the card to the center in a credit inquiry message for a selected customer in response to a communication start instruction, and controlling conversion of credit standing data for a selected customer received from the center to visible information.

4,562,342
CREDIT CARD PROVIDED WITH CODED SECURITY MEANS

Alan J. Solo, 1835 Burnett St., Brooklyn, N.Y. 11229

Filed Sep. 15, 1983, Ser. No. 532,362
Int. Cl.⁴ G06K *5/00*
U.S. Cl. 235—380 **20 Claims**

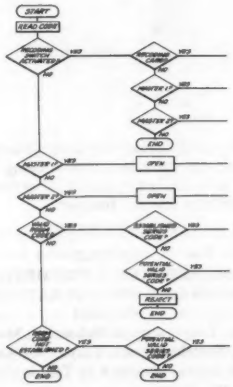


1. A credit card comprising:
a card body bearing information representing a type of credit card, and raised encoded symbols on said card identifying said card's owner; and
a plurality of foldable tabs on said card, each of said tabs having a different code means associated therewith to provide an encoded identification for checking authenticity of a user of said card when selected ones of said tabs are folded by said card user.

4,562,343
RECODABLE ELECTRONIC LOCK

Tore H. Wiik; Arild Pettersen, and Thorstein Tonnesson, all of Moss, Norway, assignors to TrioVing A/S, Norway

Filed Aug. 22, 1983, Ser. No. 525,227
Claims priority, application Norway, Sep. 2, 1982, 822966
Int. Cl.⁴ G06K *5/00*
U.S. Cl. 235—382.5 **8 Claims**



1. A method for coding of an electronic lock of the type where the lock is recoded by accepting a new valid key element simultaneously with the validity of a preceding key element being cancelled, characterized in that the lock is coded by a recoding element to retain a series of different key element codes by reading in of code element information, the key codes of said series being potentially valid to actuate the lock until a previously not used new key element having any unused code in the said series of key element codes is inserted in the lock, the lock then automatically cancelling the previously used key code of the key element in the series and being recoded to the new key element code, in order that the previously used key element(s) no longer are accepted or can influence the lock.

4,562,344
AUTOMATIC FOCUS DETECTING MECHANISM FOR ENDOSCOPES

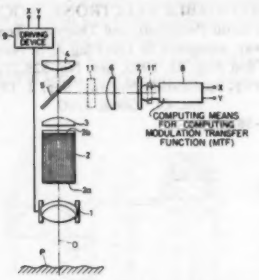
Shin-ichi Mihara; Toshihiro Imai; Ken-ichi Nakahashi; Youichi Iba; Masaki Imaizumi, and Akio Taira, all of Hachiouji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 1, 1982, Ser. No. 445,989
Claims priority, application Japan, Dec. 2, 1981, 56-194021
Int. Cl.⁴ G01J *1/20*
U.S. Cl. 250—201 **6 Claims**

1. In an endoscope comprising an objective lens system movable along an optical axis, an image-transmittmg optical fiber bundle having an entrance end face faced towards said objective lens system, and an eyepiece lens system faced towards an exit end face of said image-transmitting optical fiber bundle,
an automatic focus detecting mechanism, comprising:
a light-receiving device comprising a plurality of light-receiving elements capable of receiving a part of the light projected from the exit end face of said image-transmitting optical fiber bundle;
a computing means connected to said light-receiving device and capable of computing the modulation transfer function of an object image transmitted by said image-trans-

mitting optical fiber bundle from a picture signal obtained by said light-receiving device; and

a driving device electrically connected to said computing



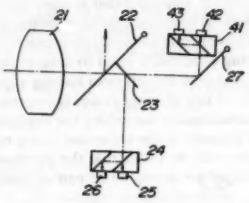
means and being operatively coupled to said objectie lens sytem; said objective lens system being constructed and arranged to be moved by said driving device to maximize said modulation transfer function.

4,562,345

METHOD AND APPARATUS FOR DETECTING FOCUS CONDITIONS OF A PHOTOGRAPHIC OPTICAL SYSTEM

Masahiro Aoki, Tokyo; Junichi Nakamura; Masatoshi Ida, both of Hachioji; Kenichi Oinoue, Tokyo, and Asao Hayashi, Hachioji, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Dec. 8, 1982, Ser. No. 448,038
Int. Cl.⁴ G01J 1/20
U.S. Cl. 250—201 **11 Claims**



1. A method of detecting focus conditions comprising

dividing the wavefront of a light beam from a photographic optical system in an image space thereof into two light beam parts, one being a first beam part passed through a first portion of an objective lens, and the other being a second beam part passed through a second portion of the objective lens,

providing first light receiving means to receive the first beam part and including a photocell array in each of the front and the rear of a surface coupled with a predetermined focal plane of the optical system,

providing second light receiving means to receive the second beam part and including at least one photocell array at a surface coupled with one of the photocell arrays in the first light receiving means,

detecting a first signal representing horizontal shift of an image based on outputs of at least one photocell array in the second light receiving means and one photocell array in the first light receiving means which is coupled with the at least one photocell array in the second light receiving means, and

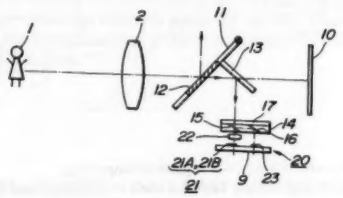
detecting a second signal representing defocused amount of the image based on outputs of two photocell arrays in the first light receiving means, whereby focus conditions of the optical system are detected by the first and the second signals.

4,562,346

APPARATUS AND METHOD FOR DETECTING FOCUS CONDITION OF IMAGING OPTICAL SYSTEM EMPLOYING BOTH SHARPNESS DETECTION AND LATERAL SHIFT DETECTION

Asao Hayashi, Tokyo; Kenichi Oinoue; Masahiro Aoki, both of Tokyo, and Masatoshi Ida, Tokyo, all of Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan

Filed May 13, 1983, Ser. No. 494,388
Claims priority, application Japan, May 18, 1982, 57-82365
Int. Cl.⁴ G01J 1/20
U.S. Cl. 250—201 **16 Claims**



1. An apparatus for detecting a focus condition of an imaging optical system comprising:

means for dividing a light flux transmitted through the imaging optical system into at least two light fluxes;

means comprising at least two light receiving element arrays arranged to receive said at least two divided light fluxes with a given optical path difference therebetween, said at least two light receiving element arrays producing illumination signals from which the focal condition of the imaging optical system is detected on the basis of an image sharpness detection;

means comprising at least one light receiving element array arranged to receive at least one of said divided light fluxes and at least one auxiliary optical system array arranged between said light flux dividing means and said at least one light receiving element array in such a manner that an exit pupil of the imaging optical system and said at least one light receiving element array are conjugated with each other, said at least one light receiving element array producing illumination signals from the focal condition of the imaging optical system is detected on the basis of an image lateral shift detection; and

means for detecting said focus condition using said means for effecting a lateral shift detection until a near in focus condition is detected, and then for detecting a focus condition using said means for effecting an image sharpness detection.

4,562,347

INPUT DEVICE FEATURING BOTH TRACKBALL AND MOUSE CAPABILITY

Dean A. Hovey, Los Altos; Douglas R. Grundstrom, San Jose, and James R. Yurchenco, Palo Alto, all of Calif., assignors to Trace Systems, Inc., Santa Clara, Calif.

Filed Sep. 23, 1983, Ser. No. 535,305
Int. Cl.⁴ G01V 9/04
U.S. Cl. 250—221 **8 Claims**

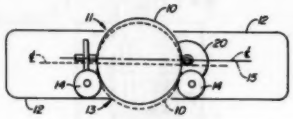
1. An input apparatus for use with a computer comprising:

a housing having a top aperture and a bottom aperture;

a spherically shaped member supported for rotation within the housing, wherein the spherically shaped member has a radius which has been selected so that portions of the spherically shaped member protrude through the top and bottom apertures of the housing; and

encoding means supported within the housing and in contact with the spherically shaped member for transforming the rotation of the spherically shaped member into computer compatible signals,

whereby positional information can be input into a computer by either positioning the input apparatus on a surface, so that the portion of spherically shaped member which



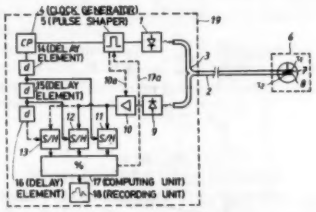
protrudes from the bottom aperture contacts the surface, and moving the input apparatus with respect to the surface, or by supporting the input apparatus, so that the portion of the spherical member protruding from the bottom aperture is unobstructed, and supplying motive force to the portion of the spherically shaped member which protrdues from the top aperture.

4,562,348

FIBER OPTICAL LUMINESCENCE MEASURING SYSTEM FOR MEASURING PHYSICAL QUANTITIES WITH TIME- OR FREQUENCY-DIVIDED SIGNAL INFORMATION

Torgny Brogardh; Bertil Hök, and Christer Ovren, all of Västerås, Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

Filed Mar. 31, 1983, Ser. No. 480,671
Claims priority, application Sweden, Apr. 1, 1982, 8202093
Int. Cl.⁴ G01D *5/26*
U.S. Cl. 250—231 R **25 Claims**



1. Fiber optical luminescence measuring system for sensing a change in a physical quantity, comprising

an electro-optical transmitter/receiver unit having light source means for emitting exciting light and receiving means for receiving luminescent light,

a sensor unit including luminescence means to generate said luminescent light when illuminated by said exciting light and means to modify the luminescent light output on a change in said physical quantity, and

at least one optical fiber means optically linking said units,

wherein luminescence means in the sensor unit is arranged to give off the luminescent light with at least two different decay time constants, and

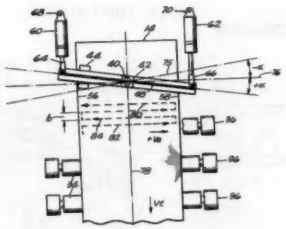
wherein the receiving means includes quotient-forming means to derive the quotient of the received intensities of the luminescent light of the different decay time constants to provide a measure of the change in the quantity to be sensed.

4,562,349

METHOD AND APPARATUS FOR SCANNING THE SURFACE OF AN OBJECT

Wolfgang Stumm, Reutlingen, Fed. Rep. of Germany, assignor to Institut Dr. Friedrich Förster Prüfgerätebau GmbH & Co KG, Reutlingen, Fed. Rep. of Germany

Filed Jul. 25, 1983, Ser. No. 516,986
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1983, 3230368
Int. Cl.⁴ H01J *5/16*
U.S. Cl. 250—234 **6 Claims**



1. In a method of scanning the surface of an object by a head, said object and head moving relative to each other along a straight line at a velocity Vt, said head further oscillating linearly at a uniform velocity of Va along a direction having a vertical component to the straight line direction of relative movement, the improvement comprising:

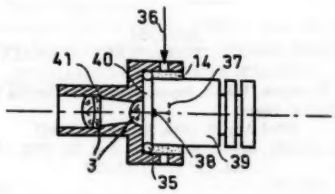
adjusting the angle of the linear oscillating direction to form an angle α with a line at right angles to the straight line direction of relative movement between the object and scanning head were $\alpha = \arctan Vt/Va$.

4,562,350

OPTICAL DEVICE CONTAINING A SEMICONDUCTOR LASER

Michel Thirouard, and Louis Arquié , both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Apr. 26, 1983, Ser. No. 488,810
Claims priority, application France, Apr. 29, 1982, 82 07424
Int. Cl.⁴ H01J *5/02*
U.S. Cl. 250—239 **6 Claims**



1. An optical device for projecting a collimated beam of radiant energy, said device comprising:

a casing having an outer cylindrical wall and an end portion containing a solid state laser source whose emissive zone releases a diverging beam of said energy;

a lens mount supporting a lens with an optical axis carrying a rear focal point wherein said lens mount includes an end bore whose mechanical axis is coaxial with said optical axis and wherein said casing incompletely fills said end bore to thereby produce mechanical play sufficient for causing the apex of said diverging beam to coincide with said rear focal point; said bore and said casing being bridged with a bond of setting adhesive material and with

compliant tightening means arranged for preventing leakage of said material toward said lens.

4,562,351

SAMPLE INTRODUCTION DEVICE FOR MASS SPECTROMETERS

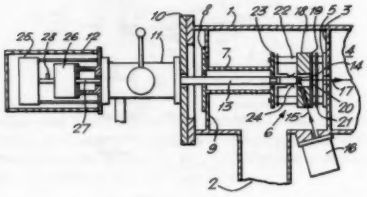
Paul Atherton, Altrincham; Peter Burns, Stockport, and Brian N. Green, Sale, all of England, assignors to VG Instruments Group Limited, England

Filed Nov. 9, 1983, Ser. No. 550,189

Claims priority, application United Kingdom, Nov. 9, 1982, 8231979

Int. Cl.⁴ H01J *49/04*

U.S. Cl. 250—288 **8 Claims**



1. A mass spectrometer having an ion source and means for carrying samples in said ion source comprising:

(a) supporting means from which a plurality of non-contiguous elements are separately mounted and on each of which elements a sample may be coated;

(b) a connecting means connecting said supporting means to an insertion probe and permitting said supporting means to move relative to said insertion probe; and

(c) a drive mechanism arranged and adapted to move said supporting means relative to said insertion probe to cause each of said elements to be brought in turn to an optimum position within said ion source for the ionization of said sample to be effected and for the ions so generated to be analysed by the mass spectrometer; said insertion probe, supporting means, connecting means and drive mechanism further being adapted to permit their insertion into and withdrawal from said ion source through a vacuum lock in at least one position of said supporting means relative to said insertion probe and without admitting air into said ion source.

4,562,352

ANALYZING APPARATUS CAPABLE OF ANALYZING A SURFACE AT A HIGH RESOLUTION

Yoshiro Shiokawa, Tokyo, Japan, assignor to Anelva Corporation, Tokyo, Japan

Filed Aug. 9, 1984, Ser. No. 639,367

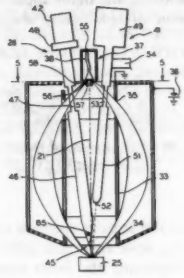
Claims priority, application Japan, Aug. 10, 1983, 58-145090

Int. Cl.⁴ H01J *37/252*

U.S. Cl. 250—305 **32 Claims**

1. In an analyzing apparatus having a principal axis and comprising holding means for holding an object having a surface with said surface disposed transversely of said principal axis, beam radiating means for radiating a radiant beam onto said surface to make said surface emit charged particles, and a cylindrical mirror type analyzer which comprises an outer and an inner cylindrical electrode member having a common cylinder axis coincident with said principal axis to define a space therebetween, said outer and said inner cylindrical electrode members defining an outer and an inner room, respectively, said inner cylindrical electrode member having an inlet and an outlet opening which surround said principal axis adjacent and remote from said holding means, respectively, said cylindrical mirror type analyzer being for analyzing the charged particles which enter said space through said inlet opening to come out thereof through said outlet opening, the improvement wherein said beam radiating means comprises:

a beam radiator having a radiator axis and a beam radiating opening for radiating said radiant beam through said radiating opening, said radiator axis being extended at least



partly in said outer room and being noncoincident with said principal axis, said beam radiating opening being disposed adjacent to said holding means; and

directing means for directing the radiant beam radiated through said beam radiating opening onto said surface at a predetermined angle relative to said principal axis.

4,562,353

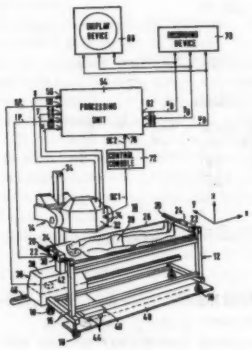
METHOD AND DEVICE FOR PRODUCING NUCLEAR IMAGES

Anthony P. Del Medico, Niles, Ill., assignor to Siemens Eammasonics, Inc., Des Plaines, Ill.

Filed Jun. 4, 1984, Ser. No. 616,984

Int. Cl.⁴ G01T *1/20*

U.S. Cl. 250—363 S **20 Claims**



1. A method for producing nuclear images of an object under investigation which emits nuclear radiation, comprising the steps of:

(a) scanning the object along a scan axis by means of a radiation detector having a radiation detector field of view;

(b) masking the radiation detector field of view by means of a mask field of view which partially exceeds the radiation detector field of view along the scan axis; and

(c) compensating the loss of sensitivity perpendicular to the scan axis in the parts of the mask field of view which exceed the radiation detector field of view by applying a weighting function proportional to the inverse of the incremental area along the scan axis bounded by the radiation detector field of view.

4,562,354
APPARATUS FOR MEASURING BETA-GAMMA RADIATION EXPOSURE

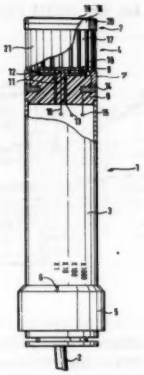
Manfred Keller, and Günter Opladen, both of Jülich, Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich GmbH, Jülich, Fed. Rep. of Germany

Filed Jul. 20, 1983, Ser. No. 515,612

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1982, 3227223

Int. Cl.⁴ G01T *1/185*

U.S. Cl. 250—388 **20 Claims**



1. Measuring instrument for radiation dosimetry in beta-gamma radiation fields, including dosimetry in inhomogeneous radiation fields, comprising an ionization chamber having a window area at least at one end thereof covered by tissue-equivalent material for beta and gamma radiation, a measuring amplifier and a measurement indicator, and incorporating the improvement wherein

said ionization chamber has side walls and has an end window of a diameter not exceeding 5 cm, other dimensions being comparably small, said side walls having apertures therein covered by tissue-equivalent material for beta and gamma radiation, and

a removable aperture diaphragm is provided for said end window having an aperture area of about 1 cm^2, the remainder of said diaphragm being opaque at least for beta radiation.

4,562,355
HIGH CURRENT ION SOURCE

Roderich Keller, Darmstadt, and Fritz Nöhmayer, Frankfurt, both of Fed. Rep. of Germany, assignors to Gesellschaft für Schwerionenforschung mbH Darmstadt, Darmstadt, Fed. Rep. of Germany

Continuation of Ser. No. 432,402, Sep. 30, 1982, abandoned. This application Feb. 28, 1985, Ser. No. 706,746

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1981, 3150156

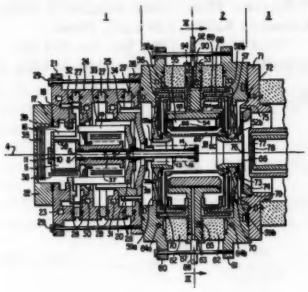
Int. Cl.⁴ H01J *27/00*

U.S. Cl. 250—423 R **10 Claims**

1. A high current ion source for generating ion beams from gases and non-volatile materials, said ion source having a longitudinal axis, comprising:

a furnace-cathode unit for generating vapor to be ionized including a furnace having a chamber and at least one opening along said longitudinal axis; a major source unit containing a discharge chamber for ionizing the vapor generated in said furnace-cathode unit, said ionization being effected by primary electrons furnished by the cathode contained in said furnace-cathode unit and energized by a voltage applied between said cathode and the surrounding wall of said discharge chamber, the efficiency of said ionization being substantially enhanced by means of a magnetic field in said discharge chamber; and an extraction unit having a source outlet electrode for removing the ions from said major source unit, said furnace-cathode, major source and extraction units including

connecting means coupling said furnace chamber to said discharge chamber along said longitudinal axis, said furnace chamber, discharge chamber, source outlet electrode and connecting means being heatable to a temperature above the condensation temperature of the vapor to be ionized and corresponding to the pressure of said vapor,



said connecting means transporting said vapor from said furnace to said discharge chamber;

a plurality of flanges defining the periphery of said units, said flanges being located at the ends of or around each of said units and providing mutual vacuum-tight connections therebetween; and

a plurality of supporting elements coupling said furnace, source discharge electrode and connecting means to corresponding ones of said plurality of flanges, said supporting elements having relatively poor heat conductivity and shapes which change as a result of thermal stresses exclusively in a direction along said longitudinal axis.

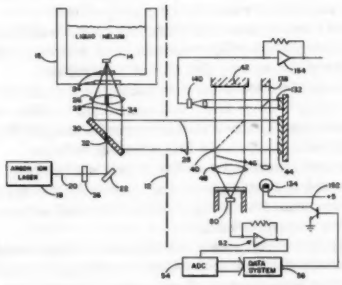
4,562,356
APPARATUS AND METHOD FOR PHOTOLUMINESCENCE ANALYSIS

Gerald L. Auth, Laguna Beach, Calif., assignor to Midac Corporation, Costa Mesa, Calif.

Continuation-in-part of Ser. No. 555,607, Nov. 28, 1983, abandoned. This application Aug. 17, 1984, Ser. No. 641,835

Int. Cl.⁴ G01J *3/00*

U.S. Cl. 250—458.1 **46 Claims**



1. An apparatus, for photo-luminescent analysis of impurities in a sample, comprising:

means for applying radiation to the surface of the sample to cause emission of photons by the sample;

means for collecting the sample-emitted photons and providing a photon beam for interferometer input;

an interferometer which receives the input photon beam and outputs a spectrally encoded photon beam; and

a detector which receives the interferometer output beam and converts it into electronic signals.

4,562,357

UNINTERRUPTIBLE POWER SUPPLY AND A STARTING METHOD

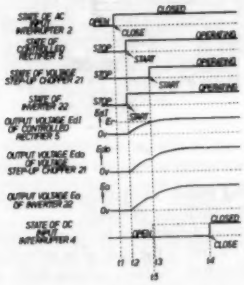
Yoshiaki Miyazawa, Hino, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 23, 1984, Ser. No. 592,560

Claims priority, application Japan, Apr. 8, 1983, 58-60995

Int. Cl.⁴ H02J *9/06*

U.S. Cl. 307—66 **14 Claims**



1. An uninterruptible power supply comprising:

controlled rectifier means adapted for receiving a first AC voltage from a source and for converting said first AC voltage into a first DC output voltage;

battery means for supplying a second DC output voltage;

voltage step-up chopper means connected to said controlled rectifier means and said battery means for stepping up said first and second DC output voltages to produce a stepped-up voltage;

inverter means connected to receive said stepped-up voltage from said voltage step-up chopper means for converting said stepped-up voltage into a second AC voltage to produce an AC power output of said uninterruptible power supply;

AC interrupter means adapted to be connected between said source of said first AC voltage and an input of said controlled rectifier means for switching said first AC voltage and for producing a first start command when said AC input interrupter means is completely closed;

DC input interrupter means connected between an output of said controlled rectifier means and said battery means for switching said second DC output voltage; and

DC voltage detector means connected to detect said first DC output voltage from said controlled rectifier means for producing a second start command when said first DC output voltage reaches a DC reference voltage;

wherein said controlled rectifier means is connected to receive said first start command from said AC input interupter means for starting operation thereof on receipt of said first start command;

wherein said inverter means is connected to receive said first start command from said AC input interrupter means for starting operation thereof on receipt of said first start command; and

wherein said voltage step-up chopper means is connected to receive said second start command from said DC voltage detector means for starting operation thereof on receipt of said second start command.

4,562,358

ELECTRONIC PRESSURE RESPONSIVE SWITCH

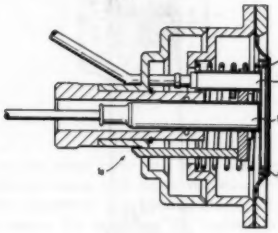
Fritz Hösel, Monchen-Gladbach, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, Monchen-Gladbach, Fed. Rep. of Germany

Filed Feb. 14, 1983, Ser. No. 466,321

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1982, 3204881

Int. Cl.⁴ H01H *35/24*

U.S. Cl. 307—118 **8 Claims**



1. An electronic pressure responsive switch sensing pressure fluctuations in a textile machine, comprising

(a) an elastic diaphragm having a first face exposed to pressure to be sensed and a reverse, second face; said diaphragm defining a first side toward which said first face is oriented and a second side towards which said second face is oriented; said diaphragm being deformable by said pressure;

(b) an activating means comprising a metal plate affixed face-to-face to said second face of said diaphragm; said diaphragm and said metal plate being displaceable together as a function of said pressure; and

(c) sensor means for generating sensor signals in cooperation with said metal plate; said metal plate remaining at all times out of contact with said sensor means; said sensor means comprising at least two proximity sensors each having a longitudinal axis extending perpendicularly to said diaphragm; said proximity sensors being situated at said second side of said diaphragm at different distances from said metal plate whereby said sensors each start generating said signals separately when said metal plate assumes two different predetermined positions relative to said sensors; said metal plate having a position in which said at least two proximity sensors generate said signals simultaneously.

4,562,359

SWITCHING ARRANGEMENT FOR ELECTRICAL INSTALLATIONS

Peter Herzig, Aarau, Austria, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Oct. 24, 1983, Ser. No. 544,790

Claims priority, application Switzerland, Nov. 1, 1982, 6340/82

Int. Cl.⁴ H01H *47/00*

U.S. Cl. 307—113 **7 Claims**

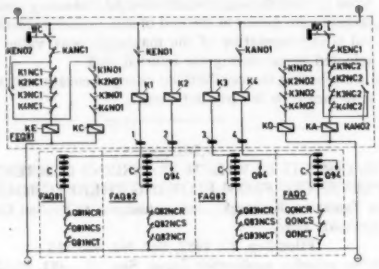
1. A protective circuit layout for a high-voltage switchgear installation comprising a plurality of high-voltage switches and a plurality of modular release units, each release unit being associated with only one of the switches, each release unit comprising at least one position signal contact indicating the switching position of the high-voltage switch associated with the release unit;

a first group of the modular units each having an output

means operatively connected to said at least one position signal contact and to an input means of each of a second group of said modular release units of said high-voltage switchgear installation;

said second group of said modular units each including release switches, each of which comprises an excitation element and at least one normally-open contact; and

each of said input means being operatively connected to a single one of the excitation elements of said release switches and to the output of a single one of the first group of modular release units of said high-voltage switchgear installation;



wherein at least one of said normally-open contacts of said release switches of one of the modular release units of said second group is operatively connected to an excitation element of the high-voltage switch associated therewith; and

wherein said normally-open contacts of said release switches of said one of the second group of modular release units are connected in a manner to accomplish a logic combination of signals fed from position signal contacts of the first group of modular release units of the high-voltage switches to the inputs of said one modular release unit.

4,562,360

MOBILE SUBSTATION

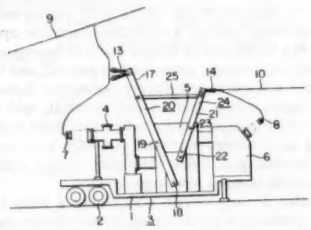
Tsunetomo Fujimoto, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Oct. 5, 1982, Ser. No. 432,809

Claims priority, application Japan, Oct. 13, 1981, 56-152568[U]

Int. Cl.⁴ H02B *5/04*

U.S. Cl. 307—149 **1 Claim**



1. In a mobile substation having equipment including a transformer, a high voltage side first terminal and a low voltage side second terminal, and a wheeled chassis supporting said equipment for movement from site to site, said first terminal being adapted for connection to a receiving line and said second terminal being adapted for connection to a feeder line, the improvement comprising:

a pair of supporting devices separate and spaced from each other, each of which has one end pivotally coupled with said chassis to support said devices for independent pivotable movement between lowered and erected positions, one of said devices being provided, when erected, to support said receiving line and the other of said devices being provided, when erected, to support said feed line by the respective other ends of said devices corresponding to the respective terminals, means for fixing to said chassis a portion of each of said devices spaced from the one end pivotally coupled with said chassis for supporting each of said devices in predetermined erected positions, and coupling means connected between said devices independent of said wheeled chassis for fixing said devices spaced from each other and in the predetermined erected positions.

4,562,361

POWER SWITCHING TRANSISTOR DRIVE CIRCUIT

Masayuki Hattori, Hachioji; Shigeo Nakamura, and Osamu Yairo, both of Hino, all of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

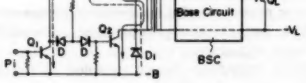
PCT No. PCT/JP82/00308, § 371 Date Mar. 30, 1983, § 102(e) Date Mar. 30, 1983, PCT Pub. No. WO83/00591, PCT Pub. Date Feb. 17, 1983

PCT Filed Aug. 7, 1982, Ser. No. 483,000

Claims priority, application Japan, Aug. 7, 1981, 56-123760

Int. Cl.⁴ H03K *3/01, 3/26*

U.S. Cl. 307—270 **4 Claims**



1. A power switching transistor drive circuit, operatively connected to receive an input signal and operatively connected to a load, comprising:

a power switching transistor, operatively connected to the load, for intermittently supplying the load with power;

a base circuit having an input terminal and an output terminal, operatively connected to said power switching transistor, for driving said power switching transistor;

a pulse transformer, operatively connected to said base circuit, having a secondary coil connected to the input of said base circuit for generating a flyback voltage and having a primary coil having first and second ends;

first and second drive transistors, respectively, operatively connected to the first and second ends of said primary coil, for intermittently rendering a current to flow in said primary coil of said pulse transformer; and

a preamplifier having an input side operatively connected to receive the input signal, and having an output side, for intermittently rendering the current to flow in said primary coil of said pulse transformer, said preamplifier comprising:

a low impedance circuit, operatively connected in series with said primary coil of said pulse transformer, for forming a closed circuit with said primary coil in response to the flyback voltage generated in said secondary coil of said pulse transformer, said power switching transistor being controlled for intermittent operation based on the input signal applied to said preamplifier, said low impedance circuit including:

a first diode operatively connected between the collector and emitter of said first drive transistor;

a second diode operatively connected between the base and emitter of said second drive transistor; and

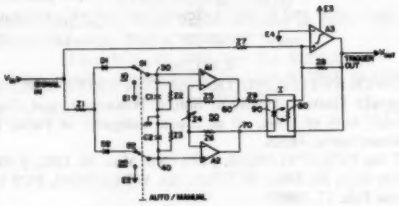
a transistor operatively connected to the input side of said preamplifier.

4,562,362

AUTOMATIC TRIGGER SENSITIVITY ADJUSTMENT CIRCUIT

Roger M. Stenbock, Canby, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 18, 1982, Ser. No. 434,819
Int. Cl.⁴ H03K *3/295*
U.S. Cl. 307—290 **12 Claims**



1. A circuit to automatically adjust the hysteresis in a Schmitt trigger amplifier having a positive feedback path including a feedback element, said hysteresis adjustment being responsive to the amplitude of an AC input signal, said circuit comprising:

a terminal means for receiving said AC input signal;

a first resistor coupled between said terminal means and the Schmitt amplifier;

an AC detector means coupled to the terminal means for producing a D.C. output signal proportional to the amplitude of the A.C. input signal; and

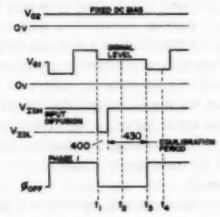
voltage variable impedance means coupled to the feedback element for altering the effective impedance of said positive feedback path in response to the D.C. output signal of said AC detector means.

4,562,363

METHOD FOR USING A CHARGE COUPLED DEVICE AS A PEAK DETECTOR

Roydn Jones, Aloha; Thomas P. Dagostino, and Luis J. Navarro, both of Beaverton, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Nov. 29, 1982, Ser. No. 445,343
Int. Cl.⁴ H03K *5/153;* **G11C** *19/28;* **H01L** *29/78*
U.S. Cl. 307—351 **8 Claims**



1. A method of detecting the maximum peak value of a selected signal utilizing a charge coupled device having, serially coupled one to the other, an input diode, a first signal gate means, a second signal gate means and at least one transfer means each having a plurality of transfer gates serially coupled one to the other, the method comprising the steps of:

(a) applying a fixed potential on said second gate means to establish thereunder a potential well having a fixed level;

(b) applying the selected signal on the first signal gate means to establish thereunder a potential well having a level which varies with said selected signal;

(c) initializing the peak detector process by pulsing the input diode on so that charges are injected beneath the input diode and said first and second signal gate means, and then reverse biasing said input diode;

(d) equilibrating the charge beneath said first and second signal gate means following the completion of step c, wherein the equilibration is carried out over a predetermined time interval during which level of the potential well under said first gate means varies while the level of the potential well under said second gate means remains fixed so that the equilibrated charge remaining under the second gate means at the end of said predetermined interval is representative of the maximum peak value of the selected signal during the interval; and

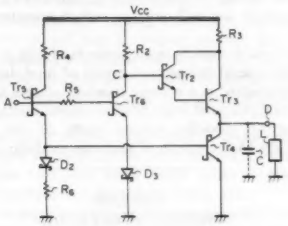
(e) transferring the equilibrated charge beneath said second gate means to the transfer means.

4,562,364

TTL CIRCUIT IN WHICH TRANSIENT CURRENT IS PREVENTED FROM FLOWING THERETHROUGH

Tetsu Tanizawa, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 27, 1982, Ser. No. 423,716
Claims priority, application Japan, Sep. 26, 1981, 56-152674; Sep. 28, 1981, 56-151999
Int. Cl.⁴ H03K *19/088, 17/16*
U.S. Cl. 307—454 **6 Claims**



1. A TTL circuit including a power supply line and ground, comprising:

an input terminal for receiving an input signal having a high logic level and a low logic level;

an output terminal for providing a logic output signal;

an inverted signal output circuit including a first transistor having a base electrode operatively connected to said input terminal, having a collector electrode operatively connected to the power supply line and having an emitter electrode operatively connected to ground, and including a second transistor operatively connected between said first transistor and said output terminal, said inverted signal output circuit having a first threshold voltage and turning on in accordance with said high logic level input signal exceeding said first threshold voltage, making said logic output signal a low logic level;

an off-buffer driving circuit comprising a third transistor having a collector electrode operatively connected to the power supply line, having a base electrode operatively connected to said input terminal, having an emitter operatively connected to ground, and having a second threshold voltage lower than the first threshold voltage of said inverted signal output circuit; and

an off-buffer circuit, having a first control terminal operatively connected to said output terminal and having a second control terminal operatively connected to said collector electrode of said third transistor, said third transistor turning on upon receipt of said low logic input signal, making said logic output signal a high logic level,

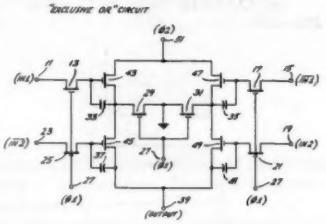
whereby said offbuffer circuit turns off upon receipt of said high logic level input signal before said inverted signal output circuit is turned on, and turns on upon receipt of said low logic level signal after said inverted signal output circuit is turned off.

4,562,365

CLOCKED SELF BOOTING LOGICAL "EXCLUSIVE OR" CIRCUIT

James W. Redfield, Pottstown, Pa., assignor to Commodore Business Machines Inc., West Chester, Pa.

Filed Jan. 6, 1983, Ser. No. 456,263
Int. Cl.⁴ H03K *19/21, 19/096*
U.S. Cl. 307—471 **10 Claims**



1. A logic EXCLUSIVE OR circuit having two pairs of input nodes and an output node for providing an "EXCLUSIVE OR" function on its output node in response to signals received on said its inputs nodes where a first and a second non-overlapping clock pulses are present, comprising:

a first, second, third and fourth gate enabled switching means being connected for receiving two input signals and the inverse signals thereof from said two pairs of inputs nodes, for providing an said output in the presence of one and only one of said two input signals, but not otherwise;

a fifth, sixth, seventh, and eighth gate enabled switching means being connected for selectively isolating and connecting said two pairs of inputs nodes from said first, second, third and fourth gate operated means; and

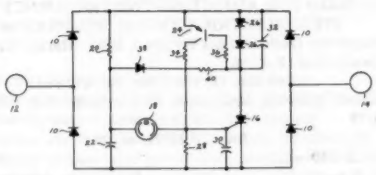
wherein said first clock pulses are received by said fifth, sixth, seventh and eighth switching means thereby controlling their conduction and said second clock pulses are received by said first and second switching means.

4,562,366

IN-LINE SOLID STATE TIME DELAY DEVICE

Andrew Zaderej, and Andrew J. Zaderej, both of 4016 N. Home St., Mishawaka, Ind. 46545

Filed Dec. 31, 1981, Ser. No. 336,284
Int. Cl.⁴ H03K *5/159, 17/60*
U.S. Cl. 307—599 **6 Claims**



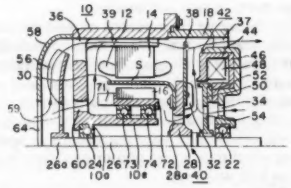
1. An in-line electrical time delay device comprising an SCR means connected at its anode and cathode between first and second terminal leads for providing a current path when switched on between said leads, said leads adapted for in-line connection between a power source and a load, a pulsing means connected between said first lead and the gate of said SCR means responsive to a selected time delay upon power source turn on for providing a triggering pulse upon termination of said selected time delay to switch on said SCR means, a transistor having its emitter-collector junction connected between said first lead and said SCR means gate and its base-emitter junction connected between said first lead and said SCR means at one of its anode and cathode, said SCR means when initially switched on by said triggering pulse for providing a bias across said transistor base-emitter junction to turn said transistor on, wherein said transistor when turned on will cause said SCR means to remain switched on.

4,562,367

LOW INERTIA, SPEED VARIABLE INDUCTION MOTOR

Hiroshi Kumatani, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 27, 1983, Ser. No. 508,043
Claims priority, application Japan, Jun. 30, 1982, 57-98959[U]; Jun. 30, 1982, 57-98960[U]
Int. Cl.⁴ H02K *9/00*
U.S. Cl. 310—62 **2 Claims**



1. A low inertia, variable speed induction motor comprising:

(a) a frame comprising a cylindrical outer wall, a circular end wall integral with said cylindrical outer wall, and a cylindrical inner wall integral with said circular end wall and extending from said circular end wall parallel to said cylindrical outer wall and in the same direction as said cylindrical outer wall;

(b) an end bracket made of a non-magnetic material attached to said cylindrical outer wall and, with said circular end wall and said cylindrical outer wall, defining a cylindrical inner working volume;

(c) an output shaft rotatably mounted in said cylindrical inner wall and said end bracket, said output shaft having a central axis which is also the central axis of said cylindrical outer wall and said cylindrical inner wall;

(d) a stator fixedly mounted on the radially outer surface of said cylindrical inner wall;

(e) a yoke rotatably mounted on the radially inner surface of said cylindrical outer wall, said yoke being disposed adjacent to said stator with a small cylindrical gap therebetween;

(f) a cup-shaped rotor made of a non-magnetic and highly electrically conductive material fixedly mounted on said output shaft, said cup-shaped rotor comprising a circular bottom extending perpendicularly from said output shaft and a cylindrical working portion projecting into the gap between said stator and said yoke toward said circular end wall;

(g) a plurality of passages formed between said cylindrical outer wall and said yoke for the passage of cooling air;

(h) a plurality of suction ports in said circular end wall for the introduction of cooling air into said cylindrical inner working volume;

(i) a cooling fan mounted on each axial side of said yoke in position to draw cooling air into said cylindrical inner working volume through said plurality of suction ports in said circular end wall and through said plurality of passages formed between said cylindrical outer wall and said yoke;

(j) a plurality of discharge ports in said end bracket for the

discharging of cooling air from said cylindrical inner working volume;

(k) a plurality of suction ports in said end bracket radially inwardly of said plurality of discharge ports in said end bracket for the introduction of cooling air into said cylindrical inner working volume;

(l) a plurality of cooling fan blades mounted on said circular bottom of said cup-shaped rotor in position to draw cooling air into said cylindrical inner working volume through said plurality of suction ports in said end bracket;

(m) a plurality of holes for the passage of cooling air in said circular bottom of said cup-shaped rotor radially inwardly of said plurality of cooling fan blades mounted on said circular bottom of said cup-shaped rotor;

(n) a plurality of passages formed between said cylindrical inner wall and said stator for the passage of cooling air in position to pass cooling air from said plurality of suction ports in said circular end wall through said plurality of passages formed between said cylindrical inner wall and said stator, thence through said plurality of holes for the passage of cooling air in said circular bottom of said cup-shaped rotor, and thence through said plurality of discharge ports in said end bracket;

(o) a heat discharge fin mounted on said circular bottom of said cup-shaped rotor and extending radially outwardly into the flow of cooling air from said plurality of passages formed between said cylindrical outer wall and said yoke to said plurality of discharge ports in said end bracket;

(p) a cooling fan mounted on said output shaft externally of said cylindrical inner working volume in position to force cooling air through said plurality of suction ports in said circular end wall; and

(q) an electromagnetic braking means actuation of which brakes said output shaft.

4,562,368

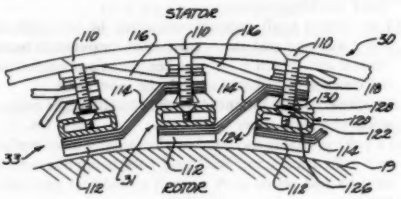
BRUSH MECHANISM FOR A HOMOPOLAR GENERATOR

William F. Weldon; John H. Gully, and William A. Walls, all of Austin, Tex., assignors to Board of Regents, Austin, Tex.

Filed May 26, 1982, Ser. No. 381,926

Int. Cl.⁴ H02K *31/00*

U.S. Cl. 310—178 **10 Claims**



1. A homopolar generator, comprising:

a stator, for producing a magnetic field;

a rotor having a slip ring surface defined thereon, for rotation within the stator magnetic field to generate an electrical potential;

a brush for contacting the rotor slip ring surface to collect current therefrom;

means for repeatedly actuating the brush into contact with the rotor slip ring; and

a brush strap having the brush attached thereto, for transferring current and for lifting the brush clear of the rotor slip ring after each actuation,

said brush strap comprising at least two independent laminations of different types of metal, for providing predetermined stiffness and dynamic stability in the axial and circumferential planes and yielding in a predetermined manner after each actuation, so that the brush will swing through the same arc and make contact in the same location on the rotor slip ring with each actuation, and providing sufficient softness radially to allow the brush to track the slip ring.

4,562,369

COMMUTATOR AND METHOD OF MANUFACTURE THEREOF

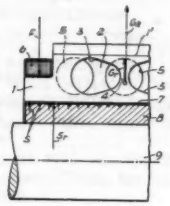
Heinz Gerlach, Ehningen, and Lothar Wörner, Stuttgart, both of Fed. Rep. of Germany, assignors to Kautt & Bux KG, Fed. Rep. of Germany

Continuation of Ser. No. 332,535, Dec. 21, 1981, abandoned. This application Dec. 31, 1984, Ser. No. 686,628

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1980, 3048470

Int. Cl.⁴ H01R *39/16, 39/52, 43/06*

U.S. Cl. 310—235 **28 Claims**



1. A commutator comprising:

an anchor shaft;

a segment set having an inner cover surface, insulating layers between adjacent segments, and an armoring;

insulation arranged between the shaft and the inner cover surface of the segment set;

said segment set being force-fittingly coupled with the shaft by support forces of the shaft directed toward the inner cover surface of the segment set;

said shaft and said insulation being radially prestressed by an essential and predeterminable part of tension forces of the armoring of the segment set;

wherein the area of the segments and insulating layers subjected to the arch-thrust is reduced by recesses in the segments and the insulating layers;

each segment of the segment set having openings therethrough with cross pieces between adjacent openings, each insulating layer having openings therethrough with cross pieces between adjacent openings, the openings in each insulating layer being arranged opposite the cross pieces of each segment.

4,562,370

METHOD FOR ADJUSTING THE FREQUENCY OF A PIEZOELECTRIC CRYSTAL RESONATOR

Bernard Von Dach, Rue des Tertres 2, 2074 - Marin - Neuchâtel, Switzerland (R.47/4)

Filed Jan. 15, 1980, Ser. No. 112,281

Claims priority, application Switzerland, Jan. 18, 1979, 473/79

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—312 **3 Claims**

1. A method for automatically adjusting the frequency of a tuning fork type piezoelectric crystal resonator having tines to an adjustment frequency, comprising cyclically performing the steps of:

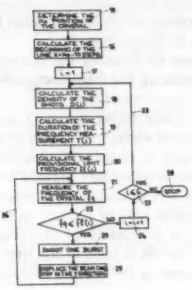
causing said resonator to vibrate at its natural frequency;

measuring said natural frequency;

comparing said measured frequency with a predetermined limit frequency; and then either

directing a burst of laser beam shots on said tines to remove

substantially the same predetermined amount of material from each tine, said burst having a predetermined density if the measured frequency is less than or equal to said predetermined limit frequency;



or increasing said limit frequency and decreasing the burst density if said measured frequency is greater than said limit frequency;

the steps of measuring said natural frequency and directing the burst of laser beam shots being performed separately and non-simultaneously.

4,562,371

RAYLEIGH SURFACE-ACOUSTIC-WAVE DEVICE USING ZNO(0001)/SIO_2/SI(111) [11$\bar{2}$]

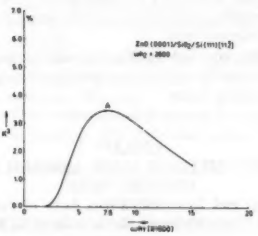
Ryuichi Asai; Takeshi Okamato, and Shoichi Minagawa, all of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Dec. 4, 1984, Ser. No. 677,713

Claims priority, application Japan, Dec. 9, 1983, 58-232446

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—313 A **9 Claims**



1. A surface acoustic wave device comprising:

a silicon substrate which is cut with a crystalline surface substantially equivalent to the (111)-surface;

a conductive layer provided on said silicon substrate;

a silicon dioxide layer provided on said conductive layer;

electrodes provided on said silicon dioxide layer for input and output of a surface acoustic wave; and

a zinc oxide layer provided on said electrodes so that a crystalline surface thereof substantially equivalent to the (0001)-surface is parallel to said (111)-oriented surface of said silicon substrate, said surface acoustic wave entered from said input electrode travelling in a direction substantially equivalent to the [11$\bar{2}$]-axis of said silicon substrate up to said output electrode.

4,562,372

PIEZOELECTRIC VIBRATING ELEMENT HAVING A RECTANGULAR CONFIGURATION

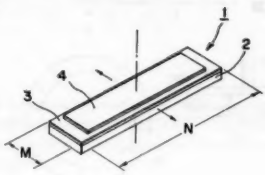
Takeshi Nakamura, Uji; Ikuo Matsumoto, Nagaokakyo, and Kenji Ando, Kawasaki, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Dec. 17, 1984, Ser. No. 682,165

Claims priority, application Japan, Dec. 26, 1983, 58-248825

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—321 **2 Claims**



1. An expansion mode vibrating element defined by an equivalent circuit including a resonance inductance L, a resistance R and a series capacitance Cs, which elements are connected in series, and a parallel capacitance Cp, which is connected in parallel with the series connection of L, R and Cs, said vibrating element comprising:

a substrate made of a constant modulus alloy and having a rectangular configuration defined by opposite long sides and opposite short sides;

a thin piezoelectric film deposited on said substrate; and

a vibration electrode film deposited on said peizoelectric film;

the ratio of the length of the long side to the length of the short side of said substrate being selected to have a value around a point where the ratio of the parallel capacitance Cp to the serial capacitance Cs is at a negative peak.

4,562,373

PIEZOELECTRIC MOTOR

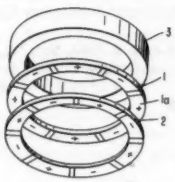
Akira Tokusima, Kyoto, and Ritsuo Inaba, Neyagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Oct. 22, 1984, Ser. No. 663,453

Claims priority, application Japan, Oct. 21, 1983, 58-197841; Oct. 21, 1983, 58-197842

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—328 **7 Claims**

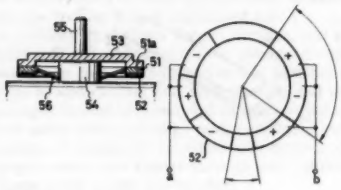


1. A piezoelectric motor characterized in that two piezoelectric vibrators each divided into at least a pair of regions whose directions of polarization are alternately reversed are arranged so that disposed on the vicinity of the middle of each said region of one piezoelectric vibrator is the boundary of each said region of the other, a base made of an acoustic material is put together with said two piezoelectric vibrator to from a stator, and a runner is provided which is in surface contact with said stator.

4,562,374
MOTOR DEVICE UTILIZING ULTRASONIC OSCILLATION

Toshiiku Sashida, 1-8, Kasuya 2-chome, Setagaya-ku, Tokyo 157, Japan

Continuation of Ser. No. 469,245, Feb. 24, 1983, abandoned. This application May 16, 1984, Ser. No. 610,933
Claims priority, application Japan, Feb. 25, 1982, 57-29400; Nov. 22, 1982, 57-205220; Dec. 26, 1982, 57-228569
Int. Cl.⁴ H01L *41/08*
U.S. Cl. 310—328 29 Claims

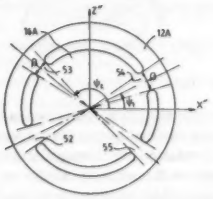


1. A motor device utilizing ultrasonic oscillation comprising:
an elastic body;
a piezoelectric member comprising a plurality of piezoelectric elements in contact with said elastic body;
electrodes formed on said piezoelectric elements;
said piezoelectric elements being arranged in first and second groups each consisting of a plurality of elements the electrodes of which groups are connected, respectively, to first and second sources of alternating current, the phase of the alternating current of said second source being displaced ninety degrees with respect to the phase of the alternating current of said first source whereby said piezoelectric elements are driven by said alternating currents applied to said electrodes to cause oscillation in said elastic body which produce a Rayleigh wave at a surface of said elastic body;
a movable body having a mating surface in contact with said surface of said elastic body; and
means for pressing said mating surface in forced contact with said elastic body surface whereby said Rayleigh wave acts upon said mating movable body surface to cause a unidirectional motion of said movable body with respect to said elastic body.

4,562,375
PIEZOELECTRIC TRANSDUCER, NOTABLY FOR PRESSURE MEASUREMENT

Raymond J. Besson; Jean-Jacques Boy, both of Besancon, and Jean-Pascal Valentin, Pouilley-les-Vignes, all of France, assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Aug. 4, 1983, Ser. No. 520,290
Claims priority, application France, Aug. 5, 1982, 82 13745
Int. Cl.⁴ H01L *41/08*
U.S. Cl. 310—338 19 Claims

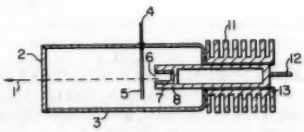


1. A piezoelectric transducer for making temperature-corrected measurements of an applied pressure, comprising:
a block of piezoelectric material having an external portion including a surface to which a pressure to be measured can be applied, a resonator pellet separated from the external portion by an interval, and a plurality of bridges connecting the external portion with the resonator pellet for transmitting forces to the resonator pellet corresponding to the pressure being applied at the surface;
means for isolating the resonator pellet from direct action of the applied pressure; and
electrode means for causing the resonator pellet to vibrate and for measuring the frequency of vibration of the resonator;
the resonator pellet being cut with a crystallographic cut having first and second vibration modes, and the bridges being arranged to transmit forces to the resonator pellet along a plane substantially parallel to the plane of the cut in directions whose azimuths are selected in relation to the crystallographic axis of the cut so that the sensitivity of the resonance frequency of the resonator pellet to the transmitted forces is high in the first vibration mode and practically zero in the second vibration mode.

4,562,376
LIGHT SOURCE FOR PRODUCING ATOMIC SPECTRAL LINE

Hideaki Koizumi, Tokyo, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 13, 1983, Ser. No. 513,316
Claims priority, application Japan, Jul. 19, 1982, 57-124456
Int. Cl.⁴ H01J *61/09, 61/52*
U.S. Cl. 313—34 13 Claims



1. A light source having an envelope containing therein an anode and a hollow cathode, for producing an atomic spectral line, comprising:
a thermally conductive member connected to said hollow cathode and externally extending out of said envelope, said thermally conductive member being formed with a hollow chamber; and
radiation fins provided on the externally extending portion of said thermally conductive member through an electrically insulating layer.

4,562,377
INSULATED SHADOW MASK ASSEMBLY FOR A PICTURE TUBE

Eiji Kamohara, and Kazuyuki Seino, both of Fukaya, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 31, 1983, Ser. No. 547,355
Claims priority, application Japan, Nov. 1, 1982, 57-190791
Int. Cl.⁴ H01J *29/07*
U.S. Cl. 313—402 5 Claims

1. A shadow mask assembly for a color picture tube, comprising:
a plurality of shadow masks, each mask having a curved surface with a plurality of apertures therein and a skirt section supporting the peripheral portion of said a curved surface, said curved surfaces being spaced from each other at a predetermined distance, wherein
skirt sections of at least two of said plural shadow masks extend substantially perpendicularly to said curved surfaces and define alternately arranged support portions and cutouts, with support portions of one skirt section facing correspond-

ing alternate cutouts of the other skirt section and cutouts of said one skirt section facing support portions of said other skirt section to prevent overlapping of said support portions

extending substantially perpendicularly to said curved surfaces and thereby electrically insulate said plurality of shadow masks from each other.

4,562,378

GALLIUM PHOSPHIDE LIGHT-EMITTING DIODE

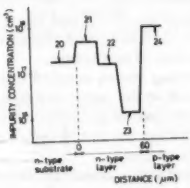
Yamazawa Tadanobu, Tottori, and Inoue Kentaro, Mikata, both of Japan, assignors to Sanyo Electric Co., Ltd. and Tottori Sanyo Electric Co., Ltd., both of, Japan

Filed Jun. 29, 1983, Ser. No. 509,186

Claims priority, application Japan, Jul. 8, 1982, 57-119207; Jul. 8, 1982, 57-119208

Int. Cl.⁴ H01L *33/00*

U.S. Cl. 313—499 **12 Claims**



1. A gallium phosphide light-emitting diode comprising;
an n-type substrate (**20**) of gallium phosphide,
a first n-type layer (**21**) formed on said n-type substrate (**20**) having an impurity concentration higher than that of said n-type substrate (**20**),
a second n-type layer (**23**) formed over said first n-type layer (**21**) having an impurity concentration lower than that of said n-type substrate (**20**), and
a p-type layer (**24**) formed on said second n-type (**23**) thereby forming a pn junction (**25**) with said second n-type layer (**23**).

4,562,379

GLOW SWITCH STARTER HAVING METAL OXIDE DEPOSIT

Yoshitomi Dobashi, Fujisawa; Masahiko Asakura, Yokosuka, and Kohtaro Kohmoto, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

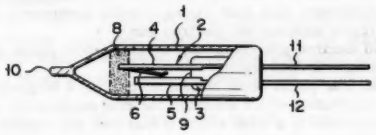
Filed Jun. 6, 1983, Ser. No. 501,093

Claims priority, application Japan, Jun. 10, 1982, 57-98552

Int. Cl.⁴ H01J *17/16, 17/24*

U.S. Cl. 313—619 **6 Claims**

1. A glow switch starter comprising:
an airtight envelope,
a dischargeable gas contained within said envelope,
an electrode assembly hermetically sealed in one end of the envelope, said electrode assembly having a stem in which a pair of electrodes, one or both of which are movable electrodes, are set, a film formed of a mixture of 40% to 90% (by weight) metal barium and 60% to 10% (by weight) metal oxide being deposited only on a region of the inner surface of the envelope, which is spaced apart from the stem, deposition having been accomplished at a rate of 0.4 mg to 12.5 mg per cubic centimeter of the



envelope capacity, said metal oxide limiting the amount of barium deposited on said electrodes thus preventing a starting voltage of said glow switch starter from dropping excessively.

4,562,380

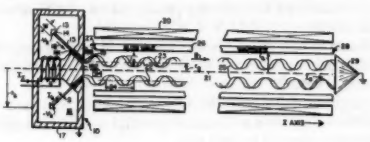
TILT-ANGLE ELECTRON GUN

Norman J. Dionne, Arlington, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Jun. 13, 1983, Ser. No. 504,028

Int. Cl.⁴ H01J *25/00*

U.S. Cl. 315—4 **12 Claims**



1. An electron gun comprising:
means for providing a conical beam of electrons having an axis of symmetry;
said means for providing a conical beam of electrons comprising an emitter, said emitter being within means for magnetically shielding;
means for providing a magnetic field along said axis of symmetry external to said shielding means;
means for magnetically shielding said beam;
said means for magnetically shielding being symmetrical with respect to said axis of symmetry and external to said magnetic field providing means;
means for focusing said electron beam within said shielding means;
said shielding means having an opening for allowing said conical beam of electrons to exit said shielding means after said beam has been focused by said focusing means;
said opening of said magnetically shielding means being within the flux external to said magnetic field providing means;
the flux density in said shielding means being below the saturation value of said shielding means to provide a magnetic flux free region at said emitter within said shielding means;
said shielding means having an inner pole extending along and symmetrical with respect to said axis;
said shielding means having a radially directed outer pole transverse to said axis and symmetrical with respect to said axis;
said inner and outer poles being separated by a space concentric with said axis to form said opening, said space forming a conical channel between said poles; and
said beam of electrons exiting said shielding means through said conical channel.

12. A gyrotron electron tube comprising:

an electron gun having an axis of symmetry for producing a conical beam of electrons;
a symmetrical slow waveguide having an axis of symmetry coincident with said electron gun axis of symmetry;
a solenoid for producing a magnetic field along said axis of symmetry, said field having a radial component in the region adjacent said electron gun;
said electron gun comprising magnetic pole pieces in said magnetic field region;
said pole pieces being shaped to provide a magnetic flux distribution which maintains the axial acceleration of said electrons at a value which is near zoer and slightly positive in the axial direction;
said electron gun comprising:
an emitter in the form of a ring having an axis of symmetry transverse to said ring;
a magnetic shield surmounting said emitter and symmetrical with respect to said axis;
said shield having an inner and an outer pole separated by a conical channel;
said conical channel having an axis of symmetry coincident with the axis of symmetry of said emitter;
means for applying a potential difference between said shield and said emitter to provide a conical beam of electrons which exits said shield through said channel;
said field within said shield being in said inner and outer poles with substantially no field within said channel and at said emitter;
said shield having a saturation flux density substantially higher than the flux density produced by said field within said shield;
said beam of electrons being subject to a magnetic field within said channel which is substantially parallel to said beam;
said magnetic field between said pole pieces and said solenoid bending from a direction parallel to said channel to a direction parallel to said axis.

4,562,381

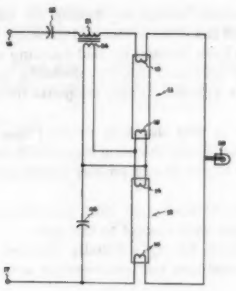
STARTING CIRCUIT FOR MULTIPLE FLUORESCENT LAMPS

Edward E. Hammer, Mayfield Village, and Eugene Lemmers, Cleveland Heights, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 599,607, Apr. 16, 1984, abandoned, which is a continuation of Ser. No. 460,718, Jan. 24, 1983, abandoned, which is a continuation-in-part of Ser. No. 313,877, Oct. 22, 1981, abandoned. This application Sep. 13, 1984, Ser. No. 650,033

Int. Cl.⁴ H05B *39/00*

U.S. Cl. 315—209 **5 Claims**



1. A fluorescent lamp lighting system for operation from an a-c voltage source in the range of about 200 to 300 volts at a frequency of about 50 to 60 hertz, comprising:
two or more series connected fluorescent lamps, each lamp having an electron emissive filament disposed within said lamp at each respective end thereof, and each said filament having first and second ends extending from said lamp for electrical connection; respective first and second ends of the respective filaments disposed at respective ends of consecutive ones of said lamps disposed proximate to each other being connected in series to provide a series combination of lamps with a total lamp length of about 96 inches; each of said lamps comprising a lamp bulb having an outside diameter of about one and one-half inches, each said bulb being devoid of any internal conductive starting aid material therealong and containing a gas fill of mercury vapor and a mixture of krypton and neon or argon in a volume ratio of about 80% to 20% at a pressure of about 1.5 torr,
connection means for connecting said series combination across said a-c voltage source; said connection means comprising first electrical conductor means for connecting a first end of a filament at one end of one of said lamps at one distal end of said series combination to a first terminal of said a-c voltage source and second electrical conductor means for connecting a first end of a filament at one end of one of said lamps at the opposite distal end of said series combination;
said first electrical conductor means including a series connected ballast comprising an inductor and a capacitor connected in electrical series and adapted to operate said lamps at a power consumption of less than ten watts per foot of lamp length;
glow switch type starter switch means connected between a second end of said filament at said one distal end of said series combination and a second end of said filament at said opposite distal end of said series combination to provide preheat current to said filaments at said distal ends prior to starting of said lamps;
secondary winding means coupled to said ballast inductor and connected to the respective ends of said filaments at said proximate ends of said consecutive ones of said lamps to provide preheat current to said filaments prior to starting of said lamps; and
starting capacitor means connected across one of said lamps.

4,562,382

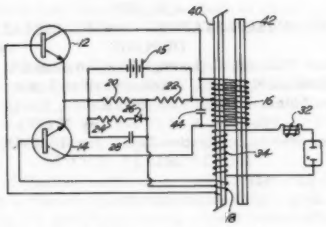
SOLID-STATE INVERTER INCLUDING A MULTIPLE CORE TRANSFORMER

William J. Elliott, Zephyr Cove, Nev., assignor to Quietlite International Ltd., Reno, Nev.

Continuation-in-part of Ser. No. 444,536, Nov. 26, 1982, abandoned, which is a continuation-in-part of Ser. No. 308,780, Oct. 5, 1981, abandoned. This application Mar. 28, 1984, Ser. No. 594,119

Int. Cl.⁴ H05B *37/02*

U.S. Cl. 315—219 **20 Claims**



1. In combination,
a source of a direct current potential,
a transformer comprising, in combination, a saturating core, first and second non-saturating cores each exhibiting sub-

stantially greater reluctance than said saturating core, a center-tapped primary winding wound on said saturating core and said first non-saturating core, a secondary winding wound on said saturating core and said second non-saturating core, and a feedback winding wound on said saturating core,

a pair of semiconductor switching devices each having a control electrode and a transconductive path,

circuit means for connecting one of said transconductive paths in series with said source across one half of said primary winding,

circuit means for connecting the other of said transconductive paths in series with said source across the other half of said primary winding,

circuit means for connecting said feedback winding to the said control electrodes to switch the conductivity of said transconductive paths in phase opposition in response to flux reversals in said saturating core,

a capacitor connected in parallel with said primary winding, and

a load circuit connected to said secondary winding.

4,562,383

CONVERTER

Max Kerscher, Chieming, and Armin Kröning, Seebruch, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

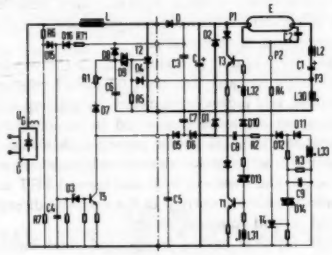
PCT No. PCT/DE82/00155, § 371 Date Feb. 7, 1983, § 102(e) Date Feb. 7, 1983, PCT Pub. No. WO83/00587, PCT Pub. Date Feb. 17, 1983

PCT Filed Jul. 29, 1982, Ser. No. 474,579

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1981, 3130424; Sep. 30, 1981, 3138994

Int. Cl.⁴ H05B *37/02, 39/04, 41/36*

U.S. Cl. 315—225 **7 Claims**



1. An inverter for use with a dc voltage source, comprising:

a dc-regulator formed of a charging capacitor connected through a charging diode and a charging inductor to said dc voltage source, and a charging circuit connected for charging the inductor wherein the dc-voltage source and a charging switch are connected in series;

a converter supplied by said charging capacitor and having alternatingly closing switches which are a primary switch and a secondary switch connected in series with each other and parallel to said charging capacitor; and

a control means for periodically closing the charging switch dependent on a square-wave voltage at said primary switch, said control means comprising a delay storage element arranged in a control charging circuit and in a control discharging circuit, the control charging circuit including said primary switch and the control discharging circuit including said secondary switch.

5. In an inverter for feeding at least one load circuit wherein said load circuit contains a series resonant circuit formed of a capacitor and inductor and a discharge lamp with two electrodes, said two electrodes lying in said load circuit such that said capacitor of said series resonant circuit is positioned between said two electrodes, and first and second alternately periodically switching devices being provided, one of which connects said load circuit to a dc voltage source and the other of which lies parallel to said load circuit, wherein the improvement comprises:

a bistable switch means having an operating mode and a shutdown mode and means connected to the bistable switch means for keeping the inverter shut down during said shutdown mode and operating during the operating mode;

holding circuit means connected to said bistable switch means for holding it in its shutdown mode, one of said electrodes of said discharge lamp lying in said holding circuit means; and

a control circuit being connected to said bistable switch means including an RC circuit connected for being charged dependent on at least one of the parameters current or voltage of said load circuit and being dimensioned such that said bistable switch means flips into said shutdown mode given a non-triggering discharge lamp.

4,562,384

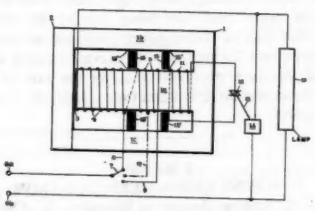
VARIABLE REACTANCE INDUCTOR WITH ADJUSTABLE RANGES

Daniel V. Owen, Hendersonville, N.C., assignor to General Electric Company, Gainesville, Fla.

Filed Apr. 19, 1983, Ser. No. 486,469

Int. Cl.⁴ H05B *41/16, 41/24*

U.S. Cl. 315—276 **6 Claims**



1. An electrical ballast comprising:

a magnetic core forming a closed magnetic circuit,

running windings comprising a main and an extended winding spaced on said core,

a control winding on said core spaced from the running windings,

means for connecting said main winding and a gaseous discharge lamp across an alternating current source to form a lamp operating circuit,

range switch means for connecting said extended winding in series with said main winding in said lamp operating circuit,

a pair of gapped magnetic shunt means in said core, one located between said control winding and said extended winding and the other between said extended winding and said main winding,

electronic switch means connected across said control winding to control the current therein and thereby the reactance of said running windings,

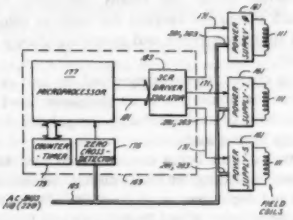
said shunt means assuring a proportionally greater control effect on the reactance in the lamp operating circuit when the extended winding is connected into the lamp operating circuit than when it is not.

4,562,385

PERIODIC RECIPROCATING MOTOR

Thomas A. Rabson, 4521 Ivanhoe, Houston, Tex. 77027

Filed Oct. 17, 1983, Ser. No. 542,634
Int. Cl.[4] H02K *41/00*
U.S. Cl. 318—135 **16 Claims**



1. Tandem periodic sweep reciprocating synchronous motor comprising:

coaxial groups of coaxial coils, sets of corresponding coils in each group being connected for simultaneous electrical energizaton,

an armature mounted for reciprocation coaxially within the coils including a plurality of elongate armature modules connected end to end, each armature module being of the same length, each armature module including alternate sections of ferromagnetic and non-ferromagnetic material, each ferromagnetic section being of the same length, each non-ferromagnetic section being of the same length,

each of said groups of coaxial coils constituting a stator module, the distance between corresponding points on each group of coils of a stator module being equal to the length of one of said armature modules,

each set of coils including a subgroup of coils from each of said groups of coils, each sub-group having an axial length greater than that of said non-ferromagnetic sections; and

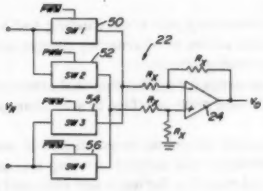
energization means for successively energizing each set of coils in timed sequence progressing along the axis of the coils repeatedly in one direction and then repeatedly in the opposite direction.

4,562,386

CURRENT SENSE DEMODULATOR

Jerry K. Goff, Ambler; Joseph A. Marinko, Jr., Chalfont; Joseph G. Venditto, Jr., Perkasie, and Donald A. Yost, Norristown, all of Pa., assignors to Performance Controls Company, Hatboro, Pa.

Filed Jan. 26, 1984, Ser. No. 573,903
Int. Cl.[4] H02P *6/02*; H03K *5/22*
U.S. Cl. 318—254 **22 Claims**



1. Apparatus for use with an amplifier regulating the current through a load according to a drive signal having first and second states comprising:

(a) a single switchless sensing means disposed in a current path through which load current flows regardless of the polarity of the load current for providing a sense signal continuously representative of the magnitude of the current through the load without the use of switching circuitry;

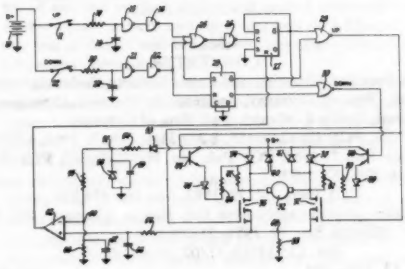
(b) polarity correction means directly coupled to the sensing means, receiving the sense signal and responsive to the status of the drive signal for providing an analog signal continuously representative of both the instantaneous magnitude and polarity of the current through the load.

4,562,387

VEHICLE POWER WINDOW CONTROL

Richard N. Lehnhoff, Kettering, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 26, 1984, Ser. No. 674,689
Int. Cl.[4] H02P *1/22*
U.S. Cl. 318—285 **5 Claims**



1. Window motor control apparatus for a vehicle window capable of movement between stopped open and closed positions comprising, in combination:

a motor drive circuit effective to drive the window motor selectively toward the open or closed position of the window, said motor drive circuit comprising a DC motor having an armature connected in an H-switch bridge across an electrical power supply with a first SCR and first FET actuable to conduct armature current in one direction and a second SCR and second FET actuable to conduct armature current in the opposite direction;

first and second actuating means;

a toggle flip-flop having toggle and reset inputs and an output deactivated when the reset input is activated;

an OR logic circuit connecting the first and second actuating means to the toggle input of the toggle flip-flop;

a second flip-flop having a set input responsive to the first actuating means and a reset input responsive to the second actuating means and a pair of outputs, each of the outputs activated in a different one of two stable states;

a first AND logic circuit having inputs from the output of the toggle flip-flop and one of the outputs of the second flip-flop and an output connected to activate the motor drive circuit toward the open position of the window;

a second AND logic circuit having inputs from the output of the toggle flip-flop and the other of the outputs of the second flip-flop and an output connected to activate the motor drive circuit toward the closed position of the window; and

means effective to detect stall current in the DC motor armature with the window in the stopped open or closed positions or due to an obstruction to window travel and activate the reset input of the toggle flip-flop, whereby the power supply is protected by the second flip-flop against a direct short circuit through an SCR and a FET in the H-switch bridge.

4,562,388
WINDUP-CONTROL SYSTEM FOR TEXTILE MACHINERY

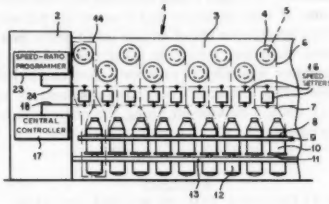
Horst Wolf, Albershausen, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany

Filed Mar. 16, 1984, Ser. No. 590,471

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1983, 3309789

Int. Cl.⁴ H02P *1/54*

U.S. Cl. 318—301 **5 Claims**



1. In a textile machine having a multiplicity of thread-winding stations each including a pair of variable speed motors adapted to operate at predetermined speed ratios and with different speeds, the combination therewith of:

an individual speed setter at each of said stations operatively connected to both of the motos thereof for setting the respective speeds of said motors establishing ratios of the speeds of said motors, said speed setters each being provided with a program for stepping the respective motors through a progressive speed increase sequence from a respective predetermined first speed level to a respective predetermined second speed level, said levels and sequence being common to all of said stations and the respective motors thereof; and

a central controller common to all said stations and connected to all of said setters for emitting timing signals for simultaneously stepping all of said setters in which the motors are between the respective first and second speed levels, to increment the respective sequences at each station individually between said levels whereby said stations can commence the respective sequences at different times.

4,562,389
AUTOMATIC SCREWDRIVER OR TORQUING TOOL CONTROL SYSTEM

Wolfgang Jundt, Ditzingen; Günter Schaal, Stuttgart; Fritz Schädlich, Leinfelden-Echterdingen; Hans-Joachim Vogt, Stuttgart, and Steffen Wünsch, Dettenhausen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 27, 1983, Ser. No. 536,194

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1982, 3236033

Int. Cl.⁴ H02P *7/00*

U.S. Cl. 318—432 **13 Claims**

1. An electric automatic nut or screwdriver control system having a drive motor (M);

electric current supply lines (1, 2, 3; 20, 21, 22);

controlled switch means (15, 16; 31) connected between the current supply lines and the motor;

current measuring means (4; 23) serially connected with the motor in one (3, 22) of the supply lines and providing a current signal representative of current flow to the motor;

and a control network responsive to said current signal and connected to and controlling said controlled switch means,

comprising, in accordance with the invention,

starting condition sensing means (FIGS. 1, 2: 6–9; FIGS. 3, 4: 26–29), coupled to said electric current supply lines, for sensing high-torque conditions of the motor which are representative of seating of a screw, being driven by the drive motor, said sensing means comprising

means (26) for sensing a maximum current and deriving a maximum current signal (b);

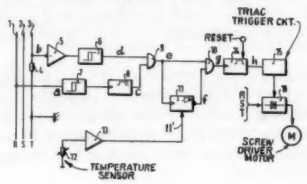
timing means (28) providing a timing signal (d) and establishing a timing interval;

means (27) for sensing minimum current being supplied to the motor and deriving a minimum current signal (c);

and the timing means (28) being connected to and controlled by the minimum current signal (c) to establish the timing interval upon sensing minimum current being supplied to the motor, the timing means being further connected to and controlling the switch control means (30) inhibiting turn-OFF of the controlled switch means by the maximum current signal until a predetermined time interval, as established by said timing means after first sensing the minimum current signal, has elapsed, to prevent spurious response of the switch control means if the maximum current sensing means provides a maximum current signal (b) in response to in-rush current, or a starting pulse at high-current level, upon first starting of the motor from stopped condition; and

a switch control means (FIGS. 1, 2: 10–14; FIGS. 3, 4: 30) connected to and controlling said controlled switch means to turn OFF, only when sensing said high-torque conditions, the switch means supplying current to the motor.

4. An electric automatic nut or screwdriver control system having



a drive motor (M);

electric alternating current supply lines (1, 2, 3; 20, 21, 22);

controlled switch means (15, 16; 31) connected between the current supply lines and the motor;

current measuring means (4; 23) serially connected with the motor in one (3, 22) of the supply lines and providing a current signal representative of current flow to the motor;

and a control network responsive to said current signal and connected to and controlling said controlled switch means,

comprising, in accordance with the invention,

phase comparator means (6–9) sensing the relative phase of the voltage being supplied to the motor and the current taken by the motor and providing a comparison phase shift signal; and

switch control means (10–14) sensing a predetermined phase shift between current and voltage and controlling the motor to turn OFF when said predetermined phase shift is exceeded, and

wherein the phase comparator means comprises

a threshold switch (6) receiving a voltage phasing signal (b) from one of said supply lines;

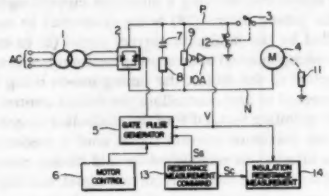
a second threshold switch (7) receiving a voltage phasing signal from one of said supply lines; and

a conjunctive gate (9) receiving the output signals (d, c) of said voltage and current sensing threshold switches, said conjunctive gate comparing the output signals from said threshold switches and providing a turn-OFF signal (e) when the output signal exceeds a predetermined duration.

4,562,390
INSULATION RESISTANCE MEASUREMENT IN STATIC LEONARD APPARATUS

Masahiro Tobise, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 3, 1984, Ser. No. 657,081
Claims priority, application Japan, Oct. 5, 1983, 58-185067
Int. Cl.⁴ G01R *31/02*
U.S. Cl. 318—490 **6 Claims**

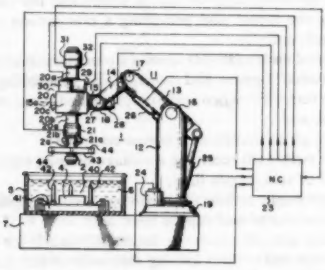


1. A static leonard apparatus comprising:
(a) a thyristor converter converting an alternating current into a direct current;
(b) a DC motor to which the DC output of said thyristor converter is supplied through a main circuit switch;
(c) a capacitor connected between the DC output buses of said thyristor converter;
(d) grounding means for grounding one of said DC output buses thereby forming a grounded closed discharge circuit for discharging said capacitor through said DC motor, said grounding means establishing said grounded closed discharge circuit when said main circuit switch is turned off;
(e) charging control means for effecting the triggering control of said thyristor converter to charge said capacitor, said charging control means charging said capacitor when said main circuit switch is in its turned-off position;
(f) voltage detecting means for detecting the voltage of said capacitor; and
(g) insulation resistance detecting means for computing the discharge time constant of said capacitor discharging through said grounded closed discharge circuit thereby detecting the insulation resistance of said DC motor on the basis of the computed discharge time constant.

4,562,391
ROBOTIC POSITIONING SYSTEM

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Kanagawa-ken, Japan

Filed Jun. 7, 1984, Ser. No. 618,191
Claims priority, application Japan, Jun. 8, 1983, 58-100953; Jun. 17, 1983, 58-107729; Aug. 31, 1983, 58-157896
Int. Cl.⁴ G05B *19/42*
U.S. Cl. 318—568 **6 Claims**

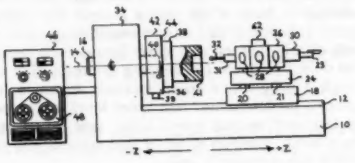


1. A robotic positioning system, comprising:
a base portion;
a plurality of interconnected arm members mounted on the base portion and having respective axes of movement;
a hand member carried at a distal end of said arm members for supporting a functional member;
a plurality of drive means associated respectively with said plurality of arm members and operable by respective drive signals for moving said arm members along said respective axes so that said functional member reaches a target spacial position and there assumes a target spacial orientation; and
a gyro assembly having a frame mounted for joint movement with one of said members and a rotor supported in the frame to rapidly spin about an axis set to orient in a predetermined direction, which is invariable relative to said base portion, whereby to provide a directional reference for monitoring a spacial orientation assumed by said one member upon a movement along the corresponding axis of movement.

4,562,392
STYLUS TYPE TOUCH PROBE SYSTEM

Richard K. Davis, Charlottesville, Va., and William S. McKnight, Fairfield, Ohio, assignors to General Electric Company, Charlottesville, Va.

Filed Aug. 29, 1984, Ser. No. 645,273
Int. Cl.⁴ G05B *19/24*
U.S. Cl. 318—572 **8 Claims**



1. Apparatus for gauging the dimensions of a workpiece mounted for machining in a machine tool, comprising:
a stylus probe mounted in a tool holding mechanism of the machine tool, said stylus having a surface for contacting other surfaces within a coordinate reference system of the machine tool;
means for controlling the position of the tool holding mechanism within the coordinate reference system and providing signals indicative of such position;
a sensor mounted for sensing vibrations induced in said stylus for providing contact indicative signals whenever said mechanism is positioned to cause contact between the surface of said stylus probe and other surfaces within the coordinate reference system, there being relative motion between the stylus surface and such other surfaces; and
means for receiving said position indicative signals and said contact indicative signals to determine the relative position of such other surfaces within the coordinate reference system, the relative position of surfaces upon the workpiece being indicative of the workpiece dimensions.

4,562,393
MODULATION SCHEME FOR PWM-TYPE AMPLIFIERS OR MOTORS

Robert J. Loyzim, Christiansburg, and Michael P. Blythe, Sterling, both of Va., assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

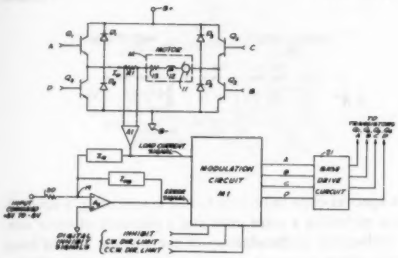
Filed Sep. 29, 1983, Ser. No. 537,028
Int. Cl.⁴ G05B *11/28*
U.S. Cl. 318—599 **11 Claims**

1. A system for energizing a DC load, which comprises:
a load circuit including the load, said load circuit being induc-

tive and having a plurality of switches responsive to pulse width modulated control signals for applying a current to the load;

means for generating at least a first pair of triangular waves, said first pair of triangular waves being adjustably offset from a baseline and each other by an amount proportional to the absolute value of the load current;

means for generating at least one triangular wave which is



interposed between said first pair of triangular waves and which has a fixed offset from the baseline;

means for comparing the triangular waves to a signal indicative of the difference between a desired current and the actual load current, thereby generating pulse width modulated control signals which apply a dithered current to the load when the desired current is relatively low and a current having a substantially decreasing form factor as the desired current is increased.

4,562,394

MOTOR SERVO CIRCUIT FOR A MAGNETIC RECORDING AND REPRODUCING APPARATUS

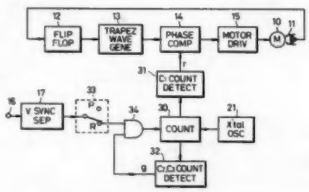
Kenji Itoh, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Japan

Filed Nov. 13, 1984, Ser. No. 670,808

Claims priority, application Japan, Nov. 14, 1983, 58-212577

Int. Cl.⁴ H02P *7/00*; **H03D** *13/00*; **G05B** *1/03*

U.S. Cl. 318—608 **7 Claims**



1. A motor servo circuit for a magnetic recording and reproducing apparatus which comprises a loop including phase comparing means for comparing the phase of a signal which is responsive to the rotation of a motor with the phase of a reference signal and for controlling the rotation of the motor responsive to an error signal which is obtained as a result of the phase comparison, said motor servo circuit comprising:

oscillator means for producing a signal having a frequency which is higher than a frequency of the reference signal;

a counter for counting the output signal of the oscillator means, said counter resetting itself when a counted value reaches a full count and being reset when a reset signal is applied thereto before the full count is reached;

a first detecting circuit for detecting that the counted value in the counter has reached a first counted value which is smaller than the full count, and for supplying the reference signal to the phase comparator means;

a second detecting circuit for detecting that the counted value in the counter has reached a second counted value which is larger than the first counted value and is smaller than the full count and a third counted value which is smaller than the first counted value, and for producing a gate signal during a time period it takes for the counted value in the counter to reach the third counted value from the second counted value, said time period including therein a time when the counter is reset; and

a gate circuit responsive to the gate signal, for supplying a vertical synchronizing signal within an input video signal which is to be recorded on a recording medium by the recording and reproducing apparatus to the counter as the reset signal.

4,562,395

DAMPED STEPPING MOTOR FOR THE DRIVING OF A MEASURING MECHANISM, PARTICULARLY A ROLLER COUNTING MECHANISM HAVING A CONTROL CIRCUIT ARRANGEMENT

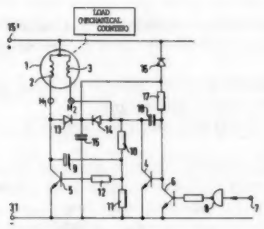
Walter Rüb, Sulzbach, and Ulrich Brüggemann, Oberursel, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 6, 1984, Ser. No. 628,531

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1983, 3324257

Int. Cl.⁴ H02P *8/00*

U.S. Cl. 318—696 **8 Claims**



1. In a stepping motor circuit for the driving of a measuring mechanism, particularly a roller counting mechanism having a control circuit arrangement which has at least one amplifier as a controlled switch, and wherein coils of the stepping motor are fed with approximately square pulses in accordance with measurement pulses supplied by a measurement transmitter, the improvement wherein

said circuit comprises a first amplifier coupled to a first coil of said stepping motor and a second amplifier coupled to a second coil of said stepping motor;

said second amplifier includes a delay circuit to induce a rounding of the edges of the pulses fed ito said second coil, and the motor is a damped low-frequency single-phase stepping motor having a two-coil system; and wherein

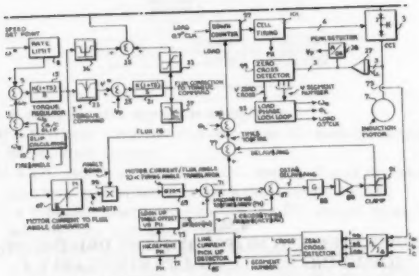
only said second amplifier has the delay circuit, and said first coil is acted on by said first amplifier directly without the use of a delay circuit, thereby to inhibit mechanical vibrations and noise associated therewith.

4,562,396

PHASE-LOCKED LOOP CONTROL OF AN INDUCTION MOTOR DRIVE

Paul M. Espelage, Salem, Va., and David L. Lippitt, Scotia, N.Y., assignors to General Electric Company, Salem, Va.

Filed Jul. 2, 1984, Ser. No. 626,999
Int. Cl.[4] H02P 5/40
U.S. Cl. 318—809 11 Claims
MICROFICHE APPENDIX INCLUDED
(1 Microfiche, 14 Pages)



1. A control for an induction motor drive comprising:

a controlled current inverter having a plurality of controllable switches coupled to said induction motor and providing variable frequency, variable magnitude current to said motor;

means for providing an induction motor speed feedback signal;

comparator means responsive to a commanded speed signal and the speed feedback signal for providing a speed error signal;

means responsive to said speed error signal for determining an inverter firing angle signal;

means for integrating motor voltages to provide motor flux signals;

means for detecting the zero crossings of the motor flux signals to provide a pulse signal at a predetermined multiple of the fundamental motor frequency;

a phase-locked loop counter synchronized to said pulse signal, said phase-locked loop counter providing a predetermined number of counts per fundamental frequency period;

a down counter clocked by said phase-locked loop counter;

means responsive to said firing angle signal for loading said down counter with the time to go to fire the next controllable switch;

means for firing the next controllable switch when said down counter times out;

means for detecting the initiation of line current in said inverter;

means for determining the delay in the initiation of line current after the firing of said next controllable switch; and

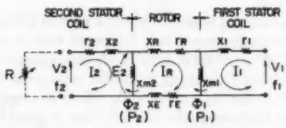
means responsive to the delay for compensating the time loaded into the down counter so as to fire a next controllable switch at an earlier time to achieve line current initiation at the time determined by said inverter firing angle signal.

4,562,397

SQUIRREL-CAGE INDUCTION MOTOR

Yukio Kitabayashi; Noriyoshi Takahashi, both of Hitachi; Toshiaki Okuyama, Ibaraki; Masatoshi Watanabe, and Hitoshi Ohura, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 26, 1984, Ser. No. 634,538
Claims priority, application Japan, Jul. 29, 1983, 58-137738
Int. Cl.[4] H02P 7/40
U.S. Cl. 318—814 9 Claims



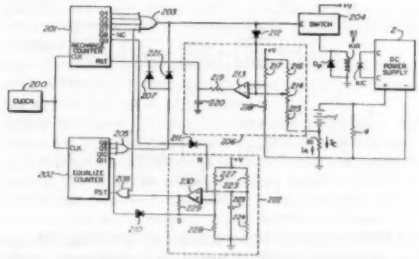
1. In a squirrel-cage induction motor comprising: a squirrel-cage rotor including a rotor core and a plurality of rotor conductors embedded in the vicinity of the surface of said rotor core; and a stator arranged in predetermined spaced relationship with said squirrel-cage rotor and including a stator core and a stator winding, wherein said stator winding includes first and second stator coils different in the number of poles from each other, said first stator coil is connected to an AC system, said second stator coil is provided with means for controlling a current flowing through said second stator coil, and said rotor conductors in the number equivalent to the average number of poles of said first and second stator coils are arranged equidistantly along the periphery.

4,562,398

BATTERY MAINTENANCE APPARATUS

Paul Kotlarewsky, Nepean, Canada, assignor to Mitel Corporation, Kanata, Canada

Filed Jan. 31, 1984, Ser. No. 575,527
Claims priority, application Canada, Jun. 8, 1983, 429,935
Int. Cl.[4] H02J 7/04
U.S. Cl. 320—31 17 Claims



1. A battery maintenance apparatus for maintaining charge in a battery connected across a source of battery charging current, comprising:

(a) means for monitoring a sum current comprised of battery drain current and float charging current of the battery;

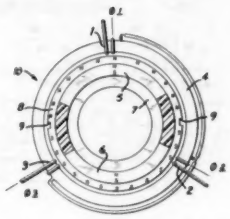
(b) means for controlling repetitive recharging of the battery at a high charging rate for first predetermined time periods in the event the monitored sum current is greater than a predetermined level; and

(c) means for controlling recharging of the battery for a second predetermined time period which is much greater than any of the first predetermined time periods in the event the battery has been recharged a predetermined number of times for said predetermined first time periods.

4,562,399
BRUSHLESS DC TACHOMETER

Robert L. Fisher, Christiansburg, Va., assignor to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Jun. 14, 1983, Ser. No. 504,072
Int. Cl.[4] H02K *39/00, 21/12;* H02P *9/00;* G01P *3/48*
U.S. Cl. 322—94 12 Claims

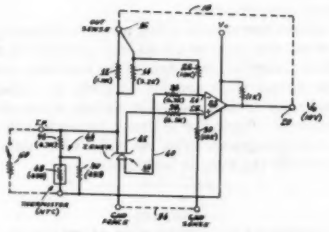


1. In a DC tachometer, the combination of
a magnetic core;
a plurality of concentrated toroidal windings on said core separated from one another;
a magnetic structure including at least one permanent magnet for establishing a magnetic field across an air gap between said structure and said core;
commutation switching means for connecting said windings to provide an output for predetermined commutation intervals; and
wherein said magnetic structure provides a substantially uniform flux density in said air gap during said commutation intervals.

4,562,400
TEMPERATURE-COMPENSATED ZENER VOLTAGE REFERENCE

Tanjore R. Narasimhan, Salem, N.H., assignor to Analog Devices, Incorporated, Norwood, Mass.

Filed Aug. 30, 1983, Ser. No. 527,749
Int. Cl.[4] G05F *5/00*
U.S. Cl. 323—281 18 Claims

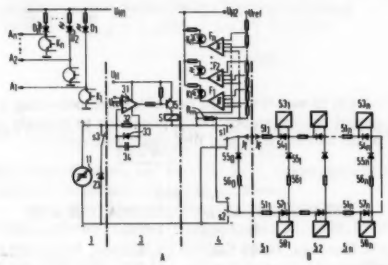


12. For use with a Zener-diode voltage reference wherein temperature-responsive means selectively controls the current through a Zener to provide temperature compensation of the reference output; a method of adjusting said voltage reference for optimum operation which includes the steps of:
operating said voltage reference at a Zener output current which is biased away from the optimum operating point;
making electrical measurements to determine an error voltage developed from operation at two different temperatures; and
altering the Zener current in proportion to the ratio of the error voltage to the difference between the dynamic impedances at the two temperatures.

4,562,401
CIRCUIT ARRANGEMENT AND METHOD FOR FAULT LOCATING IN CONJUNCTION WITH EQUIPMENT FOR THE TRUNK FEEDING OF ELECTRICAL LOADS

Alfred Ziegler, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 27, 1983, Ser. No. 546,123
Claims priority, application Fed. Rep. of Germany, Nov. 12, 1982, 3242000
The portion of the term of this patent subsequent to Mar. 26, 2002, has been disclaimed.
Int. Cl.[4] H01H *35/00*
U.S. Cl. 324—52 7 Claims



1. In a circuit arrangement for fault location in equipment for a trunk supply loop (B) that supplies electrical loads ($53_1 \ldots 53_n$; $58_1 \ldots 58_n$) by means of dc series feeding, said circuit arrangement including supply equipment provided at a supply point which is switchable from a constant current source for feeding said trunk supply loop to a constant voltage source for feeding a test circuit connected to said supply point via a resistor, said resistor being series-connected in said test circuit to a voltage source so that the current flowing in said test circuit (J_T) is oppositely directed relative to the trunk supply current (J_F), said trunk supply loop being free of devices for automatically closing the trunk supply loop ahead of a point of interruption and being fed unilaterally, there being disposed in said trunk supply loop, (1) diodes ($54_1 \ldots 54_n$; $57_1 \ldots 57_n$), connected parallel to said electrical loads, whose polarity is in the blocking direction for the trunk supply current, and (2) cross branches connected across said trunk supply loop, each comprising a series connection of an ohmic resistance ($56_1 \ldots 56_n$) and a diode ($55_1 \ldots 55_n$) whose polarity is in the blocking direction for the trunk supply current, the improvement comprising (1) additional cross branch, connected across said supply point at said supply equipment output and containing a diode which conducts current only in the test direction, and (2) a plurality of window discriminators connected across said supply point, there being one window discriminator per cross branch.

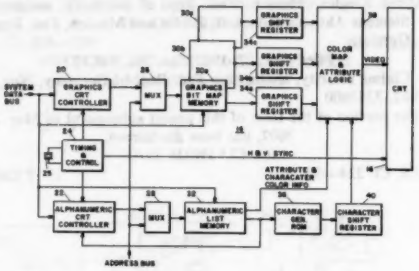
4,562,402
METHOD AND APPARATUS FOR GENERATING PHASE LOCKED DIGITAL CLOCK SIGNALS

Darrell B. Irvin, Tualatin, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 29, 1983, Ser. No. 489,978
Int. Cl.[4] H03K *1/17, 5/13, 21/36*
U.S. Cl. 328—63 6 Claims

1. A clock generator for generating two phase locked digital clocks, comprising:
a first clock generator to generate a first word rate clock equal in frequency to one N-th of a common clock applied thereto;
a second clock generator to generate a second word rate clock equal in frequency to one M-th of the common clock; and

a phase lock counter to divide the frequency of the common clock by the least common multiple of the numbers N and M, said phase lock counter receiving an input sync pulse related to said first word rate clock and providing a sync output to said second clock generator to provide gentle phase locking with said first clock generator.



4,562,403

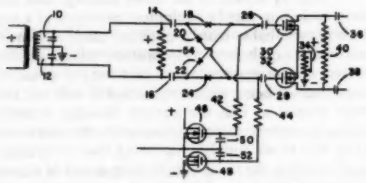
SYMMETRICAL DISCRIMINATOR AND DEMODULATOR

John S. Donovan, 16503 Santa Rosa, Detroit, Mich. 48221

Continuation-in-part of Ser. No. 615,217, May 30, 1984. This application Aug. 20, 1984, Ser. No. 642,639

Int. Cl.[4] H03D *3/26*

U.S. Cl. 329—103 **9 Claims**



1. A symmetrical discriminator and demodulator comprising:

two radio wave tuned circuits disposed in parallel having a common grounding connection for one end of each radio wave tuned circuit, the opposite end of each radio wave tuned circuit being connected to a coupling capacitor to couple the tuned circuit to a demodulator; and

a pair of diodes connected to each capacitor, the two pairs of diodes being connected together in a head to tail fashion in a cross over figure eight arrangement; the alternate junctures of said diode pairs being connected to two output coupling capacitors to provide a demodulated signal output.

4,562,404

FM DEMODULATOR WITH SELECTIVE PHASE SHIFT CIRCUITS

Tomoaki Futakuchi, Takaoka, Japan, assignor to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

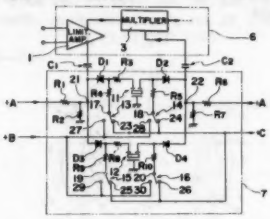
Filed Jul. 18, 1984, Ser. No. 631,995

Claims priority, application Japan, Jul. 22, 1983, 58-134964

Int. Cl.[4] H03D *3/06*

U.S. Cl. 329—118 **4 Claims**

1. In a quadrature detecting circuit which is so arranged that an FM intermediate frequency signal produced from an FM intermediate frequency amplifying circuit, and a signal obtained by subjecting the FM intermediate frequency signal to phase shifting through a phase shift circuit are respectively input to a multiplier so as to obtain an FM demodulating signal by a phase difference between these two signals, an FM demodulating circuit comprising DC blocking capacitors respectively inserted between said phase shift circuit and said FM intermediate frequency amplifying circuit, and between said phase shift circuit and said multiplier, said phase shift circuit including a plurality of piezoelectric resonators to be respectively tuned to different FM intermediate frequencies, and change-over circuits made of switching diodes and respectively connected between input and output sides of said piezoelectric resonators and said DC blocking capacitors.



4,562,405

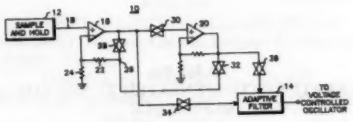
MULTIPLEXED BUFFER

Kenneth A. Hansen, Bedford, and Gary A. Kurtzman, Euless, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 27, 1984, Ser. No. 625,347

Int. Cl.[4] H03F *3/00*

U.S. Cl. 330—51 **6 Claims**



1. A buffer comprising:

a first gain stage having a low noise characteristic and being adapted to receive an input signal to be buffered;

a second gain stage having a relatively high current drive capability;

a feedback network; and

switch means operative in a first mode for coupling an output of the first stage to a load, and operative in a second mode for coupling the output of the first stage to an input of the second stage and for coupling an output of the second stage to said load, said switch means also being operative to couple the feedback network with the first and second stages such that the buffer's loop gain remains substantially the same in both modes.

4,562,406

CURRENT CONTROLLED AMPLIFIER

Jay S. Baker, San Carlos, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Sep. 16, 1982, Ser. No. 418,900

Int. Cl.[4] H03F *1/26*

U.S. Cl. 330—85 **3 Claims**

1. Apparatus for remotely controlling the amplification of an input signal by an amplifier in response to a control current, comprising:

a first inverting voltage amplification means having an input and an output;

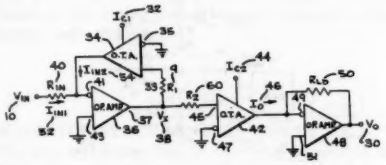
a first coupling means for coupling the input signal to the input of said first inverting voltage amplification means;

a first current amplification means for producing an output

current responsive to the product of an input current and a control current having the output current coupled to the input of the first inverting voltage amplification means;

a second coupling means for coupling the output of the first inverting voltage amplification means to the input of the first current amplification means;

a second current amplification means for producing an output current responsive to the product of an input current and a control current;



a second coupling means for coupling the output of the first inverting voltage amplification means to the input of said second current amplification means;

conversion means for converting the output of said second current amplification means to a corresponding voltage; and,

control means, responsive to a control signal, for producing a first and second control signal to control the first and second current amplification means respectively.

4,562,407

AUTOMATIC REGULATION OF THE OUTPUT POWER OF AN AMPLIFIER

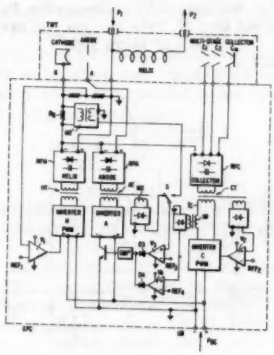
Manfred Wassermann, Backnang, and Wolfgang Liebisch, Sulzbach, both of Fed. Rep. of Germany, assignors to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Filed Jun. 1, 1984, Ser. No. 616,161

Claims priority, application European Pat. Off., Jun. 3, 1983, 83105479

Int. Cl.⁴ H03G *3/20*

U.S. Cl. 330—129 **15 Claims**



1. In a method for automatically regulating the high frequency output power of a high frequency amplifier having a current supply device which provides the power required for the amplifier to generate said high frequency power, and including a regulating circuit wherein a first voltage which is related to the high frequency output power of the amplifier is obtained and used to generate a regulating voltage which is then utilized to produce a control signal for controlling the amplifier gain, the improvement comprising:

deriving said first voltage from the supply voltage or the supply current of the current supply device for the amplifier;

generating a first regulating voltage component from said first voltage and a first reference voltage;

deriving a second voltage which is dependent on the value of said control signal;

generating a second regulating voltage component from said second voltage and a second reference signal; and

utilizing essentially only said second regulating component as said regulating voltage to produce said control signal for said high frequency output power in the low and medium power range covering approximately the linear operating range of the amplifier; and

utilizing essentially only said first regulating component as said regulating voltage to produce said control signal for high frequency output power in the high power range.

4,562,408

AMPLIFIER HAVING A HIGH POWER SOURCE NOISE REPRESSION RATIO

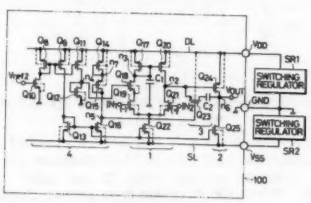
Kenji Nagai, Kodaira, and Fumiaki Fujii, Tokyo, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 13, 1983, Ser. No. 560,873

Claims priority, application Japan, Dec. 13, 1982, 57-216845

Int. Cl.⁴ H03F *3/16*

U.S. Cl. 330—253 **34 Claims**



1. An amplifier comprising:

a non-inverting input terminal;

an inverting input terminal;

a first differential input field effect transistor of a first conductivity type, having the gate thereof connected to said inverting input terminal;

a second differential input field effect transistor of the first conductivity type, having the gate thereof connected to said non-inverting input terminal;

an active load circuit having a first terminal to which the drain of said first differential input field effect transistor is connected, a second terminal to which the drain of said second differential input field effect transistor is connected, a third terminal to which a power source terminal is connected, and a control element connected between said second and third terminal and having the conductance thereof controlled in accordance with the potential of said first terminal;

a phase compensation circuit connected to said second terminal of said active load circuit;

a feedback circuit applying an output signal generated on the basis of a signal occurring at said second terminal of said active load circuit to said inverting input terminal; and

a phase regulation circuit connected to said first terminal so that the phase of a potential change of a power source voltage applied to said power source terminal becomes substantially equal to the phase of a potential change occurring at said second terminal of said active load circuit due to the voltage change of the power source voltage.

4,562,409

CAVITY RESONATOR COUPLING-TYPE POWER DISTRIBUTOR/POWER COMBINER

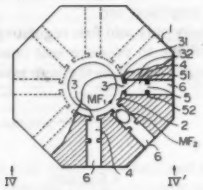
Toshiyuki Saito; Naofumi Okubo, both of Kawasaki, and Yoshiaki Kaneko, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

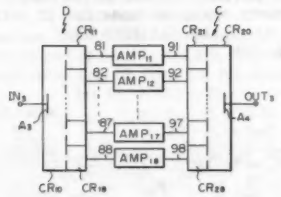
Filed Mar. 26, 1984, Ser. No. 593,429

Claims priority, application Japan, Mar. 29, 1983, 58-53259

Int. Cl.⁴ H03F *3/60*; H01P *5/12*

U.S. Cl. 330—286 **37 Claims**





1. A cavity resonator coupling-type power distributor/-power combiner, comprising:

first conducting means, having an input/output end and an antenna, for conducting input/output signals of microwave electric power;

a first cavity resonator, operatively coupled to the antenna of said first conducting means by electric field coupling, having an axis and a symmetric shape with respect to the axis and resonating with a cylindrical $TM_{0,n,0}$ mode, where n is a positive integer;

a plurality of second cavity resonators arranged on the periphery of and operatively coupled by magnetic-field coupling to said first cavity resonator and extending radially and symmetrically with respect to the axis of said first cavity resonator, each of said second cavity resonators having the same shape and size and each of said second cavity resonators comprising:

a cavity formed by a waveguide;

a first window formed between said first cavity resonator and said cavity, for establishing magnetic-field coupling therebetween; and

a second window formed in the waveguide opposite said first window; and

a plurality of second conducting means having output/input ends, each of said second conducting means operatively coupled to a corresponding one of said second cavity resonators via said second window of the corresponding one of said second cavity resonators, which establishes electromagnetic-field coupling therebetween, for conducting output/input signals of microwave electric power between said second cavity resonators and the output/input ends of said second conducting means.

4,562,410

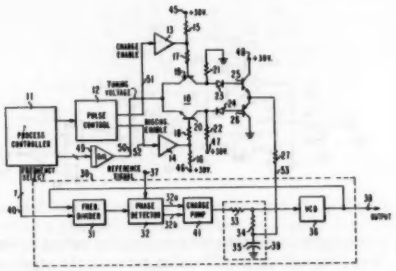
PHASE LOCK LOOP PREPOSITIONING APPARATUS WITH FEEDBACK CONTROL

David P. O'Rourke, Philadelphia, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 29, 1983, Ser. No. 566,794

Int. Cl.⁴ H03L *7/00*

U.S. Cl. 331—1 A **13 Claims**



1. In a phase lock loop including a loop filter capacitor and a voltage-controlled oscillator (VCO), wherein said VCO is responsive to the dc voltage level at one electrode of said capacitor for determining the frequency of oscillation of said VCO, an apparatus for altering said oscillation from a first frequency to a second frequency, said apparatus comprising:

source means for providing a dc signal having a voltage level corresponding to said second frequency;

means for comparing said source means dc signal voltage level with said capacitor dc level; and

means responsive to said comparing means for providing current to said capacitor when the voltage level of said source means dc signal is unequal to the dc voltage level at said capacitor electrode.

4,562,411

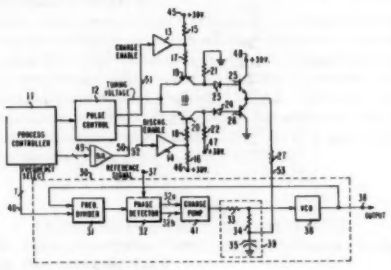
PREPOSITIONING CIRCUIT FOR PHASE LOCK LOOP

David P. O'Rourke, Philadelphia, Pa., and Richard O. Yeager, Camden, N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Dec. 29, 1983, Ser. No. 566,883

Int. Cl.⁴ H03B *3/04*

U.S. Cl. 331—1 A **19 Claims**



1. In a phase lock loop including an oscillator having an input terminal and responsive to the voltage level of a control signal applied thereto for providing an output signal of a first frequency, means for dividing the frequency of said output signal by a division factor selectable by a division factor input signal, means responsive to the phase difference between said frequency-divided output signal and a reference signal of a predetermined second frequency for generating a signal representative of said phase difference, and a low pass filter coupled

between said generating means and said oscillator, said filter including a capacitor coupled between said oscillator input terminal and a reference voltage, an apparatus for effecting a rapid change of said oscillator output signal frequency from said first frequency to a new frequency, said apparatus comprising:

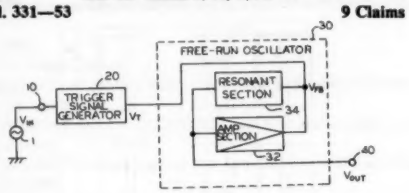
control means for providing said division factor input signal and a tuning voltage signal corresponding to said new frequency; and

means for providing a current to said filter capacitor when the level of said tuning voltage signal is unequal to the voltage at said capacitor.

4,562,412
OSCILLATOR SYNCHRONIZED TO A PULSE

Mitsutoshi Sugawara; Kazuo Tokuda, and Tokio Sawataishi, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed May 31, 1983, Ser. No. 499,387
Claims priority, application Japan, May 31, 1982, 57-92584
Int. Cl.⁴ H03B *5/00, 5/36*
U.S. Cl. 331—53 **9 Claims**



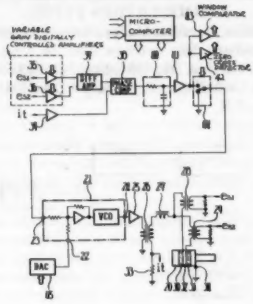
1. An oscillator circuit comprising an input terminal supplied with an input a.c. signal having a first frequency, a signal generator coupled to said input terminal and in response to said input a.c. signal generating a trigger pulse every time said input a.c. signal crosses a reference potential, said trigger pulse being generated twice during one cycle period of said input a.c. signal, a free-running oscillator oscillating at a second frequency approximately equal to a frequency of n times (n being an integer and at least two) as high as said first frequency, means coupled between said free-running oscillator and said signal generator for supplying said trigger pulse to said free-running oscillator, and means coupled to said free-running oscillator for deriving an output signal.

4,562,413
DRIVING FREQUENCY CONTROLLING METHOD FOR AN ULTRASONIC TRANSDUCER DRIVING APPARATUS

Shoji Mishiro, and Seiji Hamada, both of Kawasaki, Japan, assignors to Taga Electric Company Ltd., Tokyo, Japan

Filed Jun. 13, 1983, Ser. No. 503,536
Claims priority, application Japan, Jul. 21, 1982, 57-127158
Int. Cl.⁴ H03B *5/30*
U.S. Cl. 331—116 R **6 Claims**

1. In a driving frequency controlling method for an ultrasonic transducer driving apparatus of the type wherein by differential detection equal damping current components are offset from and cancel each other while the difference between voltages proportional to dynamic current components produces a vibration velocity signal which is used as a frequency controlling signal for effecting the locking feature of PLL tracking, the improvement wherein one of higher and lower ranges of a phase characteristic of a transducer resonant frequency is made flat by controlling the proportionality characteristic of the voltages whereafter the frequency of a voltage controlled oscillator is swept through one of said flat ranges

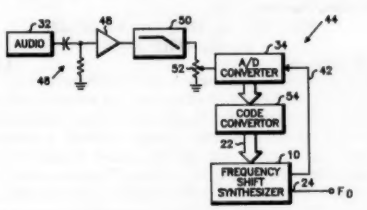


toward a resonant frequency to determine the fundamental resonant frequency.

4,562,414
DIGITAL FREQUENCY MODULATION SYSTEM AND METHOD

Donald L. Linder, Palatine, and William R. Murphy, Chicago, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 27, 1983, Ser. No. 565,947
Int. Cl.⁴ H03C *3/00*
U.S. Cl. 332—9 R **29 Claims**



1. In a frequency modulation system of the type which transforms an analog modulating signal to a signal substantially constant in amplitude by varying in frequency from a center frequency responsive to a characteristic of said analog modulating signal, the improvement comprising:

frequency synthesizer means including an output and not more than one frequency control input for receiving digital frequency control signals and for varying the output frequency at said output by an amount related to said digital frequency control signals; and

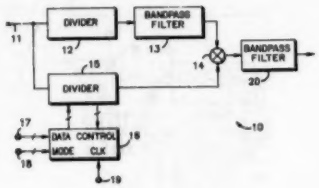
digital frequency control signal generating means coupled to said frequency control input for providing said frequency control input with said digital frequency control signals in response to said characteristic of said analog modulating signal; and

means for synchronizing said digital frequency control signal generating means with said frequency synthesizer means.

4,562,415
UNIVERSAL ULTRA-PRECISION PSK MODULATOR WITH TIME MULTIPLEXED MODES OF VARYING MODULATION TYPES

Carol D. McBiles, Paradise Valley, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 22, 1984, Ser. No. 623,688
Int. Cl.[4] H03K *07/00;* **H03C** *03/00;* **H04L** *27/20*
U.S. Cl. 332—9 R **20 Claims**



1. A modulator having a carrier signal input, a data input, a mode select input, a clock input and an output, said modulator comprising:

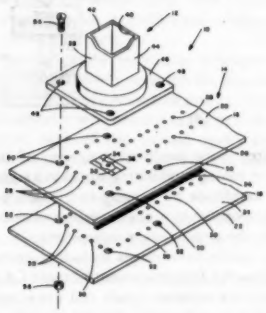
control means for controlling the type of modulation of said modulator, said control means having a first input, a second input, a third input, a fourth input and an output, said first input being coupled to said carrier signal input of said modulator, said second input being coupled to said data input of said modulator, said third input being coupled to said mode select input of said modulator and said fourth input being coupled to said clock input of said modulator; and

a mixer having a first input, a second input and an output, said first input being coupled to said carrier signal input of said modulator, said second input being coupled to said output of said control means and said output being coupled to said output of said modulator.

4,562,416
TRANSITION FROM STRIPLINE TO WAVEGUIDE

Darrel F. Sedivec, Lawrence, Mass., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed May 31, 1984, Ser. No. 615,620
Int. Cl.[4] H01P *5/107*
U.S. Cl. 333—26 **3 Claims**



1. A coupler for microwave coupling between a waveguide and a stripline, the coupler comprising:

A. a waveguide of elongated rectangular cross section having an opening at one end;

B. a first generally planar ground-plane conductor covering the opening of the waveguide and forming an elongated aperture communicating with the waveguide interior through the waveguide opening;

C. a second generally planar ground-plane conductor spaced apart from the first ground-plane conductor and extending generally parallel to it;

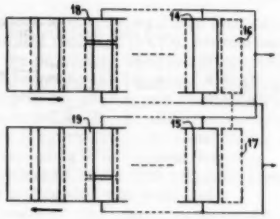
D. shorting elements extending between the ground-plane conductors to connect them together and surrounding the aperture in the first ground-plane conductor to form a cavity defined by the ground-plane conductors and the shorting elements; and

E. a feed line including a generally T-shaped feed element having a stem that extends between and generally parallel to the ground-plane conductors and into the cavity and having a crosspiece extending longitudinally of the aperture and shorted to the ground planes at its ends.

4,562,417
TRANSVERSE CHARGE TRANSFER FILTER

Gérard Béal, and Jean-Louis Coutures, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Apr. 15, 1983, Ser. No. 485,214
Claims priority, application France, Apr. 23, 1982, 82 07062
Int. Cl.[4] H03H *9/70;* **H01L** *29/78*
U.S. Cl. 333—165 **13 Claims**



1. A transverse charge transfer filter having N MOS capacitors, each including a selected one of a reading electrode (6,18,19), having a gap therein, and a control electrode (3,4,5,14,15), disposed on the same semiconductor substrate (1) and distributed into delay stages,

each delay stage being defined by one MOS capacitor provided with a reading electrode (6,18,19) and a plurality of MOS capacitors each provided with a control electrode, said reading electrode (6, 18, 19) and control electrodes (3,4,5,14,15) being arranged as a series of partially overlapping (r1,r2) adjacent electrodes,

each of said control electrode (3,4,5,14,15) serving as a selected one of a transfer (3,5) electrode and a storage (4,14,15) electrode and each of said reading electrodes (6,18,19) serving as a storage electrode outside of time periods reserved for reading, said transfer electrodes (3,5) and said storage electrodes (4,6) being separated from each other by an insulating oxide layer (7,8) and arranged to alternate in said series,

whereby, in each delay stage, the ends of alternate electrodes are covered (r1,r2) by the ends of two adjacent electrodes,

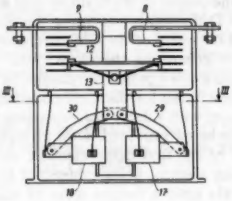
wherein the N MOS capacitors are arranged in n rows, with n even, numbered from 1 to n, at the rate of N/n MOS capacitors per row, the MOS capacitors of each row being numbered from 1 to N/N in ascending order along the direction defined by the charge transfer direction in row number 1, and

wherein the transfer direction in two adjacent rows is opposite, which makes it possible to compensate for the effects resulting from displacements of the mask used to carry out the deposition simultaneously of the electrodes of the transverse charge transfer filter, the ends of which are covering the ends of two adjacent electrodes.

4,562,418
ELECTROMAGNETICALLY OPERATED ELECTRIC SWITCH

Sven Bachler, Västerås, Sweden, assignor to ASEA Aktiebolag, Västerås, Sweden

Filed Jul. 9, 1984, Ser. No. 628,910
Claims priority, application Sweden, Jul. 11, 1983, 8303929
Int. Cl.⁴ H01H 67/02
U.S. Cl. 335—131 **10 Claims**

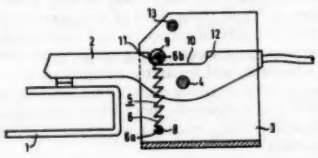


1. An electromagnetically operated electric switch comprising:
- a stand,
- a first fixed contact,
- a second fixed contact being disposed at a distance from said first contact,
- a movable contact for connecting said first and second fixed contacts,
- a movable contact carrier for supporting said movable contact,
- electromagnetic means controlling engagement of said movable contact with said fixed contacts, said electromagnetic means comprising an operating magnet with two substantially equal magnetic cores, said cores being movable in opposite directions along a line which is substantially perpendicular to the direction of movement of the contact carrier,
- rotatable arms for connecting said contact carrier to said magnetic cores, and
- leaf springs for suspending said magnetic cores from said stand, said spring being arranged so as to control the movement of said cores.

4,562,419
ELECTRODYNAMICALLY OPENING CONTACT SYSTEM

Bernhard Preuss, and Karl-Heinz Manthe, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich and Berlin, Fed. Rep. of Germany

Filed Dec. 21, 1984, Ser. No. 684,477
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1983, 3347120
Int. Cl.⁴ H01H 77/10
U.S. Cl. 335—195 **8 Claims**

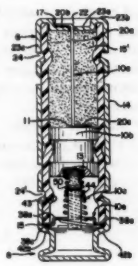


1. An electrodynamically opening contact system comprising
- a fixed contact element;
- a movable contact element;
- means for pivotally supporting said movable contact element;
- said fixed and movable contact elements being arranged with respect to one another that the electromagnetic forces arising about said contact elements as a result of current passing therethrough causes said contact elements to separate;
- guide means formed in said movable contact element and extending generally transversely to the pivot axis thereof;
- spring means having a first, pivotally mounted end and a second, free end, said second end bearing upon said guide means;
- said spring means being so disposed with respect to said guide means that in a closed contact position the line of action of said spring means extends at substantially right angles to said guide and to one side of the pivot axis and in an open position said line of action extends to the other side of said pivot axis.

4,562,420
TIME DELAY FUSE

Joseph W. Kowalik, Skokie, and David J. Krueger, Arlington Heights, both of Ill., assignors to Littelfuse, Inc., Des Plaines, Ill.

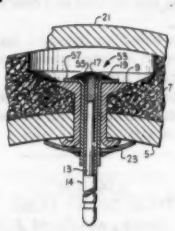
Filed Apr. 13, 1984, Ser. No. 599,757
Int. Cl.⁴ H01H 71/20, 85/04
U.S. Cl. 337—165 **13 Claims**



1. In a time delay fuse comprising an initially open end insulating housing having conductive terminals at the opposite ends thereof, current-heatable means connected to one of said terminals, a thermal mass in heat communication with said current-heatable means, spring and current- carrying means electrically coupled between said current-heatable means and the other terminal to complete a circuit between said terminals, and a heat meltable connection between said thermal mass and said spring and current-carrying means, said spring and current-carrying means being spring urged away from said thermal mass so that upon the melting of said heat meltable connection said spring and current-carrying means will be pulled away from said thermal mass to break the physical and electrical connection of said spring and current-carrying means with said current-heatable means, the improvement wherein said current-heatable means, thermal mass and spring and current-carrying means form a sub-assembly insertable as an untensed unit into an initially open end of said housing before the associated terminal is applied thereto, said spring and current-carrying means being anchored to said initially open end of said housing and the rest of the sub-assembly being pushed axially inward thereof to stretch a spring portion of said spring and current-carrying means, said spring and current-carrying means comprises a longitudinally extending conductive strip surrounded by a longitudinally extending coil spring which is said spring portion, the ends of said strip being connected respectively to said other terminal and to said thermal mass through said meltable connection, spring tension retaining

means engaging with said sub-assembly to hold said coil spring in its stretched conditions, and said conductive strip having an axially inwardly facing shoulder adjacent to which a turn of said coil spring is located so that upon collapse of said spring the spring will pull said strip away from said thermal mass.

4,562,421
BRAKE WEAR SENSOR
Dennis A. Duffy, 5806 Hayter Ave., Lakewood, Calif. 90712
Filed Jan. 31, 1983, Ser. No. 462,537
Int. Cl.[4] B60Q *1/100*
U.S. Cl. 340—52 A **3 Claims**



1. An electrical sensor element for closing an electrical circuit when a drum type brake wear reaches a pre-determined amount, comprising:

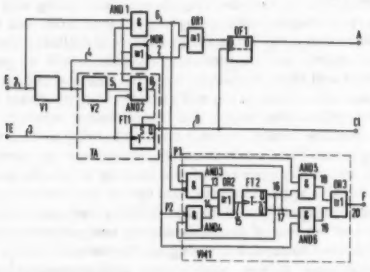
an insulated electrical conductor wire having said insulation removed at one end so as to expose the bare wire;

a shouldered insulator sleeve enveloping and bonded to said bare end of said electrical conductor arranged so said bare end of said conductor wire protrudes above said shoulder on said insulator sleeve;

abradable insulation material covering said exposed end of said bare wire and at least the contiguous portion of said shoulder on said shouldered insulation sleeve; and

fastener means to slide over said sleeve portion of said shouldered insulation sleeve for retaining said sensor element in palce when installed.

4,562,422
CMI DECODER
Reginhard Pospischil, Lochham, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Jan. 16, 1984, Ser. No. 571,003
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1983, 3302761
Int. Cl.[4] H03M *5/12*
U.S. Cl. 340—347 DD **7 Claims**

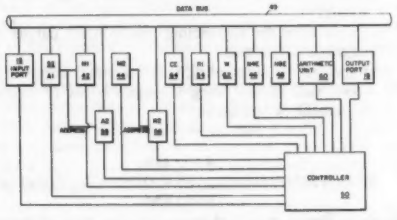


1. A CMI decoder for converting CMI-coded signals into binary signals by means of a delay means and a subsequently added gating network, comprising, in combination

(a) means for generating decoded binary signals of full bit width, first inputs of a first AND gate and of a NOR gate as well as the input of a first delay element with a delay of approximately one half of a bit duration being connected to an input for the CMI-coded signals; second inputs of the first AND gate and of the NOR gate being connected to the output of the first delay element; and each of the outputs of the first AND gate of the NOR gate being connected separately to the two inputs of the first OR gate, the D input of a first clocked D flipflop being connected to the output of the first OR gate and the Q output of the first D flipflop representing the binary output signals of full bit width of the CMI decoder, and

(b) means for generating the clock pulse for the first D flipflop from a clock pulse with double bit frequency used during regeneration for the CMI-coded signals,-a second delay element with a delay corresponding to one half of a bit duration being provided, with its input connected to the output of the first delay element, the output of the second delay element being connected to the input of a second AND gate; a further input of the second AND gate being connected to the input for the CMI-coded signals; the clock-pulse input of a first frequency divider stage and an inverting input of the second AND gate being connected to the clock-pulse input for the regeneration clock pulse; the output of the second AND gate being connected to the setting input of the first frequency divider stage; and the Q output of the first frequency divider stage being connected to the clock-pulse input of the first and second D flipflops.

4,562,423
DATA COMPRESSION
Pierre A. Humblet, Cambridge, Mass., assignor to Codex Corporation, Mansfield, Mass.
Continuation of Ser. No. 311,877, Oct. 15, 1981, abandoned. This application Jun. 5, 1984, Ser. No. 617,151
Int. Cl.[4] H03K *13/24*
U.S. Cl. 340—347 DD **8 Claims**



1. Apparatus for encoding a stream of source characters into a stream of codewords, each of said source characters being from a source alphabet, each of said source characters in said source alphabet having a possibly time-varying frequency of appearance in said stream of source characters, each said codeword being associated at a given time with a rank in a rank ordering, the rank ordering being indicative of the current estimated relative frequencies of appearance of the codewords associated with said ranks, each of said codewords belonging to one of a plurality of groups of said codewords, said codewords in said groups comprising respectively different numbers of subwords, said apparatus comprising:

an encoder for encoding each of said source characters into one of said codewords, more frequently appearing source characters being encoded as codewords having fewer subwords,

a monitor for monitoring the occurrences, in said stream of source characters, of said source characters associated with a set of fewer than all of said ranks in said rank ordering, and

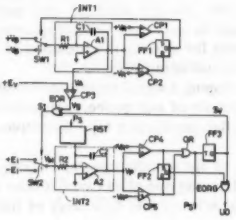
a group size selector responsive to said monitor for changing

the numbers of codewords belonging respectively to said groups, whereby at least a portion of said stream of codewords is shortened.

4,562,424
CIRCUIT FOR INTEGRATING ANALOG SIGNAL AND CONVERTING IT INTO DIGITAL SIGNAL

Katsuaki Takagi, Hachioji; Yuzo Kita, Fuchu; Yoshimune Hagiwara, Kodaira; Shuichi Torii, Higashiyamato, and Kazuyoshi Ogawa, Kodaira, all of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering Ltd., both of Tokyo, Japan

Filed Jul. 26, 1983, Ser. No. 517,398
Claims priority, application Japan, Jul. 28, 1982, 57-130337
Int. Cl.⁴ H03K *13/02*
U.S. Cl. 340—347 NT **7 Claims**



1. An integrator circuit comprising:

an operational amplifier;

an integrating capacitor which is disposed between an input terminal and an output terminal of said operational amplifier; and

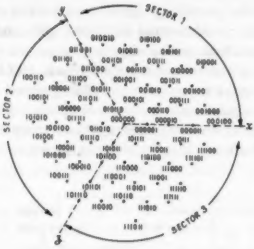
means for resetting charges of said integrating capacitor in response to a control pulse in a state in which said integrating capacitor is connected to said operational amplifier for, at least, a period from start to end of the resetting, including a resetting capacitor in which charges opposite in polarity to said charges of said integrating capacitor are stored before the control pulse is generated and means for connecting said resetting capacitor to said integrating capacitor in response to the control pulse.

4,562,425
DIFFERENTIAL ENCODER AND DECODER FOR TRANSMITTING BINARY DATA

Laurence F. Turner, Bishop's Stortford; John W. Bailey, Keston, both of United Kingdom, and Henry H. Parrish, Miami Springs, Fla., assignors to Racal-Milgo Limited, Berkshire, England

Filed Jan. 20, 1983, Ser. No. 459,504
Claims priority, application United Kingdom, Feb. 2, 1982, 8202919
Int. Cl.⁴ H03K *13/24, 7/10*
U.S. Cl. 340—347 DD **16 Claims**

1. Apparatus for encoding binary data into symbols for transmission comprising first means for marshalling the data into n-bit data-words where n is plural, and second means coupled to the first means an responsive to at least (2^n-1) different ones of the possible 2^n different data-words therefrom to produce symbols arranged in three like groups in three 120°-phase-sectors respectively, the sector in which a symbol is produced being rotated by 0°, 120° or 240° relative to the nextpreceding sector in which a symbol was produced depending upon which of the said at least (2^n-1) data-words is to be

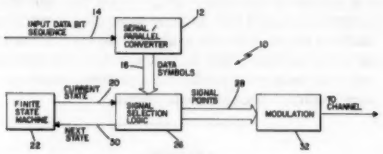


transmitted, and a differential encoder for differentially encoding said symbols.

4,562,426
SYMBOL CODING APPARATUS

George D. Forney, Jr., Cambridge, Mass., assignor to Codex Corporation, Mansfield, Mass.

Filed Nov. 8, 1982, Ser. No. 439,740
Int. Cl.⁴ H03K *13/24*
U.S. Cl. 340—347 DD **17 Claims**



1. Apparatus for sending digital symbols by transmitting discrete signals corresponding to said symbols over a band-limited channel using a modulated carrier system, said discrete signals being drawn from an alphabet of available signals, comprising

a finite-state device that occupies, at any given time, one state from among a finite number of possible states, said one state depending on previously sent said symbols, each possible transition from a previous said state to a current said state being associated with a subset of said alphabet signals,

signal selection logic comprising means to receive each said symbol to be sent, to receive a current state from said finite state device, and to deliver a corresponding said signal selected from one said subset among a plurality of said subsets whose respective members are such that at least two of said subsets have at least one said available signal in common, and at least one said available signal belongs to only one said subset, and

a modulator for modulating a carrier in accordance with said delivered signal.

4,562,427
SYSTEM AND METHOD FOR STABILIZING ASYNCHRONOUS STATE MACHINES

William W. Ecton, Augusta, Kans., assignor to NCR Corporation, Dayton, Ohio

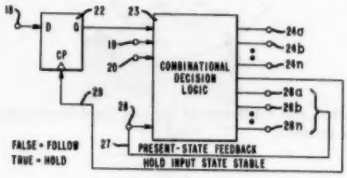
Filed Jan. 28, 1983, Ser. No. 461,905
Int. Cl.⁴ H04Q *9/00;* **H03K** *19/173*
U.S. Cl. 340—825.5 **7 Claims**

1. A stabilization system for an asynchronous state machine, said stabilization system comprising:

a combinational decision logic circuit having a plurality of input terminals for receiving digital signals, a selected one

of said input terminals for receiving an asynchronous digital signal whose state is stabilized, a plurality of feedback signal input terminals, a plurality of feedback output terminals for providing signals representative of a present state of said combinatinal decision logic circuit, said state being dependent on the state and sequence of said digital signals received on said input terminals, and holding signal output means for providing a holding signal dependent on the state of said combinational decision logic circuit;

a first circuit connecting said feedback output terminals to said feedback signal input terminals for feeding back present state information of said combinational decision logic circuit;



latching means having an input for receiving a selected asynchronous digital signal and an output connected to said selected one of said input terminals;

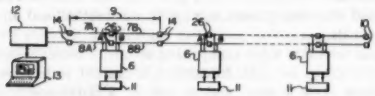
and a second circuit connected between said holding signal output means and said latching means for controlling said latching means whereby said selected asynchronous digital signal is transmitted to said selected one of said input terminals only upon predetermined state conditions of said combinational decision logic circuit.

4,562,428

INTRUSION DETECTOR

R. Keith Harman, Kanata, and Dale R. Younge, Nepean, both of Canada, assignors to Senstar Security Systems Corp., Ontario, Canada

Filed Sep. 24, 1982, Ser. No. 423,842
Claims priority, application Canada, May 14, 1982, 403015
Int. Cl.⁴ G01B *13/18, 26/00*
U.S. Cl. 340—552 **25 Claims**



1. An intrusion detector comprising:

(a) a pair of spaced leaky coaxial cables,

(b) at least one pollable terminal connected to first adjacent ends of the cables, for receiving and/or transmitting digital data signals along one or both of said cables,

(c) control means connected to the other adjacent ends of the cables for polling said terminal or terminals and for transmitting to and/or receiving digital data signals from the terminal or terminals along one or both of said cables,

(d) means for applying a CW radio frequency signal to one of said cables,

(e) means for receiving the radio frequency signal from the other of the cables, and

(f) means for detecting predetermined variation in the received signal from said other cable,

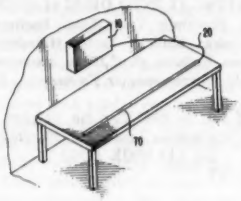
whereby the approach of a body to the vicinity of said cables causing said variation in the received radio frequency signal can be determined, thereby providing warning of a possible threat to the transmission of said data signals.

4,562,429

STATIC EVENT DETECTOR AND TAPE PROBE

John T. Conway, Lockport, and Robert C. Albone, Middleport, both of N.Y., assignors to Monroe Electronics, Inc., Lyndonville, N.Y.

Filed Apr. 27, 1982, Ser. No. 372,127
Int. Cl.⁴ G08B *21/00*
U.S. Cl. 340—657 **18 Claims**



1. A probe circuit for sensing the presence of charged objects, said probe circuit comprising:

a probe for developing a signal representative of the electric field in the vicinity of said probe, said probe including

a first layer of flat conductive tape operative as a pickup electrode,

a second layer of flat conductive tape acting as a shield electrode and having one of its two flat sides aligned with one of the flat sides of said first layer of flat conductive tape, and

a first strip of dielectric material aligned with and positioned between said first and second layers of conductive tape; and

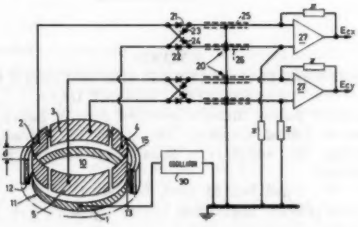
means electrically coupled to said first and second layers of tape for sensing said electric signal developed by said probe.

4,562,430

POSITION DETECTION DEVICE FOR MAGNETIC BEARING

Alan A. Robinson, Wassenaar, Netherlands, assignor to Agence Spatiale Europeenne, Paris, France

Filed Dec. 20, 1982, Ser. No. 451,551
Claims priority, application France, Dec. 24, 1981, 81 24241
Int. Cl.⁴ G08C *19/10*
U.S. Cl. 340—870.37 **6 Claims**



1. A position detection device for detecting the position of a movable member in relation to a fixed member along two axes, said position detection device comprising:

a capacitive transducer including a fixed member and a movable member separted from each other by an annular gap;

said fixed member comprising first and second axially separted equal-diameter metallic electrode rings, the first of said rings being a continuous metallic electrode mounted onto an insulating support and the second of said rings

comprising four thin metal foil electrodes separated by four equal-width narrow gaps spaced at angular intervals of 90° mounted onto an insulating support;

said movable member comprising a thin walled metallic cylinder concentrically surrounding the fixed member such that said movable member capacitively coupled the first and second electrode rings of said fixed member;

means for connecting each pair of diametrically opposed electrodes of said second ring of the fixed member to an electronic position control circuit; and

means for connecting the first ring of the fixed member to a voltage source.

4,562,431

FUEL FILTER UNIT WITH WATER CONTENT INDICATOR

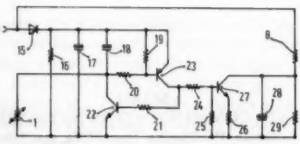
Horst Jahnke, Stuttgart; Brigitte Moro, Gerlingen; Erich Scholz, Neuhausen, and Hans Siebke, Ditzingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 26, 1983, Ser. No. 498,250

Claims priority, application Fed. Rep. of Germany, May 26, 1982, 3219729

Int. Cl.⁴ G08B *21/00*

U.S. Cl. 340—604 **6 Claims**



1. Fuel filter unit equipped for detection of water in the filter unit, comprising a water sensor (1) for providing a signal when water in said filter unit reaches a predetermined quantity or level, an evaluation circuit including an indicator (8, 36) for producing a warning in response to appearance of said signal and circuit means connected to said evaluation circuit for reduction of the current in said sensor after appearance of said signal without substantially affecting the output of said evaluation circuit which is provided to said indicator (8, 36), said circuit means including a first transistor (22) having its controlled path connected in parallel to said sensor (1) and its control electrode connected in circuit for causing said transistor to become conductive during the provision of said output of said indicator.

4,562,432

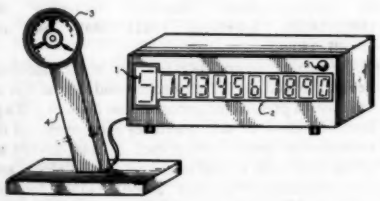
VOICE OR BLOW-CONTROLLED SWITCHBOARD

Steve Sremac, 3549 Agate Dr., #8, Santa Clara, Calif. 95051

Filed Aug. 19, 1982, Ser. No. 409,621

Int. Cl.⁴ G09G *3/00*

U.S. Cl. 340—706 **2 Claims**



1. An apparatus for controlling electrical appliances by the use of an operator's breath, comprising:

a display means including a plurality of indicators, said indicators being sequentially enabled, one at a time, for a finite period, each said indicator corresponding to a particular appliance to be controlled,

a switching means including a plurality of switches for selectively turning "ON" and "OFF" a corresponding pluality of appliances, said switching means being connected to said display means and being responsive to a single, breath operated switch such that, during the time an appliance indicator is enabled, a first actuation of said breath operated switch causes the switch corresponding to that appliance, after a predetermined delay, to reverse its "ON" or "OFF" state, and causes said display means to keep said enabled appliance indicator enabled during said predetermined delay,

said switching means being further responsive to a second actuation of said breath operated switch during said predetermined delay, to prevent the reversal of said corresponding switch and to cause said display means to resume said sequential enablement of said appliance indicators.

4,562,433

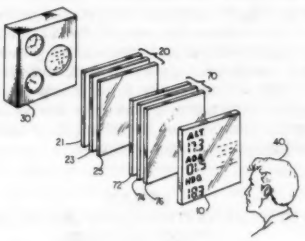
FAIL TRANSPARENT LCD DISPLAY

Michael A. Biferno, Duarte, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Continuation-in-part of Ser. No. 183,346, Sep. 2, 1980, Pat. No. 4,371,870. This application Nov. 26, 1982, Ser. No. 444,801

Int. Cl.⁴ G09G *3/00*

U.S. Cl. 340—716 **11 Claims**



1. A display system comprising:

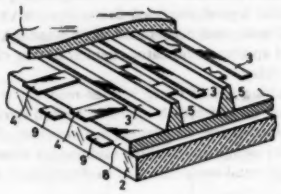
a primary liquid crystal display comprising a first liquid crystal display means located closest to a viewer wherein information is presented to the viewer within an at least one information location on the first display means, a second liquid crystal display means located an effective distance behind the first display means wherein substantially all of the second liquid crystal display means is energized to operate in a reflective mode simultaneously with said presentation of information on said first display means and a selectively energizable electroluminescent panel means interposed between the first and second liquid crystal display means which provides illumination for the first liquid crystal display means when energized and is substantially transparent when not energized, the electroluminescent panel means comprising an intermediate layer of a transparent electroluminescent material held between two transparent electrode layers; and

a secondary display wherein the secondary display is located directly behind the primary liquid crystal display such that, upon a termination of power to the primary liquid crystal display, the primary liquid crystal display becomes substantially transparent and the backup display then becomes visible to the viewer.

4,562,434
PLASMA DISPLAY PANEL

Yoshifumi Amano, Kamakura, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 19, 1982, Ser. No. 399,799
Claims priority, application Japan, Aug. 17, 1981, 56-128470
Int. Cl.[4] G09G 3/28
U.S. Cl. 340—775 14 Claims

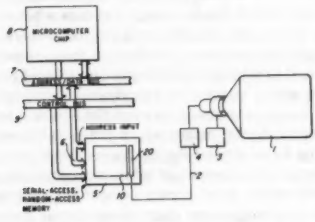


14. A display apparatus comprising a sealed envelope with at least one side transparent, a gas capable of glowing within said envelope, a plurality of parallel extending anode electrodes mounted in said envelope in a first plane, a plurality of parallel extending cathode electrodes mounted in said envelope in a second plane and extending substantially ninety degrees to said anode electrodes, means for applying driving voltage during the same horizontal scanning period to selected cathode electrodes, a plurality of parallel trigger electrodes mounted in said envelope and extending in the same direction as said cathode electrodes and mounted near said cathode electrodes so as to periodically initiate invisible discharge between selected trigger and cathode electrodes, with one trigger electrode for two cathode electrodes and respectively mounted therebetween, adjacent m trigger electrodes connected together to form m groups of trigger electrodes, certain of said cathode electrodes mounted adjacent one of said groups of trigger electrodes and commonly connected together to form different groups of cathode electrodes and means for applying driving voltages during a horizontal scanning period for driving selected ones of said anode electrodes and to said groups of cathodes and to one of said groups of trigger electrodes.

4,562,435
VIDEO DISPLAY SYSTEM USING SERIAL/PARALLEL ACCESS MEMORIES

Kevin C. McDonough; David S. Laffitte, both of Houston, and John M. Hughes, Spring, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 29, 1982, Ser. No. 427,236
Int. Cl.[4] G09G 1/02
U.S. Cl. 340—798 10 Claims



1. A video display system comprising:

a video display having raster scanning means and a video signal input for instantaneously determining the brightness and/or color of display on a screen,

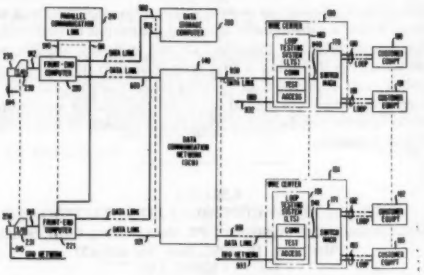
a bit-mapped video memory including a memory array having a plurality of rows and columns of read/write memory cells in a semiconductor substrate, addressing means in the substrate for addressing the array, and means in the substrate for coupling the array to two separate data ports, one of said two data ports including a serial register in the substrate having a bit-serial output connected by an output terminal of the substrate and by a serial data path external to the substrate to said video signal input of the video display, the serial register having a parallel input connected to said array for loading the register in parallel with video data bits from the array selected by said addressing means, the other of said two data ports being a bit-parallel port for data access to the array for read and write to update video information in the bit-mapped memory,

and a microprocessor device having parallel data/address bus means separate from said serial data path and coupled to said memory for supplying addresses to said addressing means of the memory and for accessing the data in said array via said bit-parallel port to update the video information in the bit-mapped memory.

4,562,436
DATA COMMUNICATION NETWORK

Charles L. Coleman, Parsippany Troy Hills, and Harvey Rubin, Morristown, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 16, 1982, Ser. No. 399,186
Int. Cl.[4] H04Q 9/00; H04M 3/24
U.S. Cl. 340—825 9 Claims



1. A data network (140) comprising

data communication elements including devices (1401–1412), interfaces (1421–1468) and circuits (14001–14096)

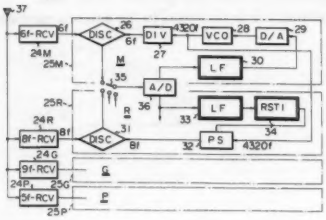
first connecting arrays (141–144) for interconnecting said devices to said interfaces, eachof said first arrays associated with a preselected group of said devices and a predetermined block of said interfaces and comprised of data transmission means linking each of said devices in said group with each of said interfaces in said block, and

second connecting arrays (e.g., 145501–145504) for interconnecting said interfaces to said circuits, each of said second arrays associated with a predetermined grouping of said interfaces and a preselected set of said circuits and comprised of data bus means linking each of said interfaces in said grouping with each of said circuits in said set.

4,562,437
DIGITAL LOOP FILTER

Shunroku Sasaki, Yokohama; Kazuo Tsukada, Kakogawa; Yoshiharu Kanzaki, Sagamihara, and Yoshikazu Hori, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 27, 1982, Ser. No. 453,112
Claims priority, application Japan, Dec. 29, 1981, 56-211395
Int. Cl.[4] G01S 1/30
U.S. Cl. 343—394 9 Claims



8. A receiver for a phase-comparison radio navigation system, operatively connected to receive a control signal, having phase-tracking circuits for receiving input signals having high frequency components and for generating output signals phase-locked with the received input signals which are transmitted by a master station and a plurality of slave stations, said phase-tracking circuit comprising:

signal-generating means, operatively connected to receive the control signal, for generating a first output signal, the phase of the first output signal of said signal-generating means being controlled by the control signal;

a phase discriminator, operatively connected to said signal-generating means, for detecting the phase difference between the first output signal of said signal-generating means and the input signals of said phase-tracking circuit and for generating a second output signal;

an A/D converter, operatively connected to said phase discriminator, for receiving and digitalizing the second output signal;

a digital loop filter, operatively connected to said A/D converter, for attenuating the high frequency components of the second digitalized output signal and for generating the control signal, said digital loop filter comprising:

a feedback circuit, operatively connected to said phase discriminator, for receiving the control signal, for outputting a first digital output signal, for adding the first digital output signal to the second output signal after a predetermined delay and for generating a third output signal;

a feed-forward circuit, operatively connected to said feedback circuit, for multiplying the third output signal by a predetermined constant and for adding the resultant signal to the first digital output signal of said feedback circuit to generate a second digital output signal; and

a multiplier, operatively connected to said feed-forward circuit, for multiplying the second digital output signal of said feed-forward circuit by a second predetermined constant and for generating a third digital output signal;

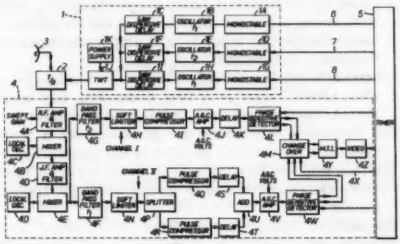
a D/A converter, operatively connected to said digital loop filter, for receiving the control signal and converting it into an analog signal; and

a frequency divider operatively connected between said D/A converter and said phase-discriminator.

4,562,438
RADAR APPARATUS

David G. Rouse, Halstead, and Christopher F. Wilkinson, Hungarton, both of England, assignors to The Marconi Company Limited, Chelmsford, England

Filed Sep. 24, 1981, Ser. No. 305,343
Claims priority, application United Kingdom, Sep. 27, 1980, 8031288; Jul. 23, 1981, 8122717
Int. Cl.[4] G01S 7/28, 13/28
U.S. Cl. 343—17.1 R 12 Claims



1. Radar system comprising:

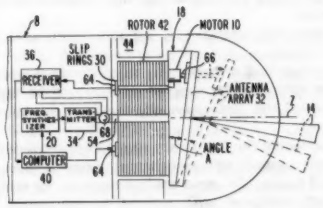
a radar transmitter including pulse producing means for producing a train of pulse groups, said pulse producing means including means for forming the pulse groups so that each group contains a long pulse and first and second short pulses separated by the long pulse, means for spacing the pulse groups so that the pulse groups are relatively widely spaced in time compared to the spacing of the pulses within each group, means for providing the short pulses of each group with distinguishing characteristics so that upon reception the first and second short pulses of a group can be distinguished from each other, and means for transmitting the train of spaced pulse groups; and

receiver means for receiving pulses transmitted by said radar transmitter, said receiver means including distinguishing means for distinguishing between the first and second short pulses based upon the distinguishing characteristics, and delay means for delaying one of the short pulses so that at the output of said delay means the first and second short pulses of a group are coextensive in time.

4,562,439
IMAGING RADAR SEEKER

Eduardo J. Peralta, Santa Ana, and Kay M. Reitz, Tustin, both of Calif., assignors to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Dec. 13, 1982, Ser. No. 449,102
Int. Cl.[4] G01S 7/28
U.S. Cl. 343—17.1 R 5 Claims



1. An imaging radar system for producing a two-dimensional image of a target, comprising:

means for transmitting a series of pulses of electromagnetic

energy whereby the frequencies of each two adjacent pulses differ;

coupled to the transmitting means, means for radiating the transmitted pulses in such a way that the radiated pulses remain fixed on the target over time, and reflect off the target;

synchronized with the transmitting means, means for receiving the reflected pulses;

coupled to the receiving means, means for performing an inverse Fourier transform on the received pulses to produce an amplitude versus range distribution; and

coupled to the inverse Fourier transform means, means for performing a Fourier transform on the amplitude versus range distribution to produce an amplitude versus doppler frequency distribution;

wherein the produced image of the target is related to amplitude versus range in a first dimension, and amplitude versus doppler frequency in a second dimension;

the frequency differences are generated by a frequency synthesizer coupled to an input of the transmitting means;

the radiating means comprises a planar array of linear antenna elements coupled to an output of the transmitting means; and

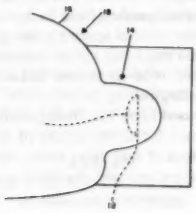
the radiated pulses are kept fixed on the target by tilting means which tilts the planar array to compensate for angular changes of the radiated pulses caused by changes in frequency imparted by the frequency synthesizer.

4,562,440

ANTENNA COUPLER WITH RIBBON GASKET

Robert G. Pothier, Amherst, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Dec. 23, 1983, Ser. No. 564,663
Int. Cl.⁴ H01Q *1/28*
U.S. Cl. 343—703 **6 Claims**



1. The method of making an antenna coupler for holding a test antenna in a fixed position on the exterior surface of a structure relative to a working antenna disposed within the structure comprising the steps of:

(a) making a negative mold of the structure adjacent the working antenna;

(b) using the negative mold to make a positive mold of the structure adjacent the working antenna;

(c) attaching releasable support members to the positive mold;

(d) attaching a temporary support structure to the support member;

(e) connecting repositioning members to the positive mold for allowing the support structure to be repeatably removed and replaced in the same position on the positive mold;

(f) replacing the temporary support structure with a permanent support structure having antenna mounting means and having the same configuration as the temporary support structure with respect to the support members whereby the permanent support structure is placed in the same positional relationship on the positive mold as the temporary support structure and the antenna mounting means is placed in a position to hold the test antenna in the fixed position, the support structure having a bottom peripheral edge positioned in spaced relationship to the surface of the positive mold;

(g) disposing a ribbon gasket for shielding RF energy in conformity with the surface of the positive mold adjacent the spaced bottom peripheral edge of the permanent support structure;

(h) permanently interconnecting the ribbon gasket and the bottom peripheral edge with a resilient material having RF attenuation capability to form the antenna coupler;

(i) removing the antenna coupler comprising the combined permanent support member, interconnecting material, and ribbon gasket from the positive mold; and,

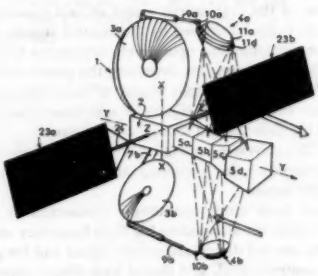
(j) attaching the test antenna to the antenna mounting means.

4,562,441

ORBITAL SPACECRAFT HAVING COMMON MAIN REFLECTOR AND PLURAL FREQUENCY SELECTIVE SUBREFLECTORS

Guiliano Beretta, Paris, France, and Antonio Saitto, Oegstgeest, Netherlands, assignors to Agence Spatiale Europeenne-European Space Agency, Paris, France

Filed Dec. 3, 1982, Ser. No. 446,610
Claims priority, application France, Dec. 4, 1981, 81 22744
Int. Cl.⁴ H01Q *1/28*
U.S. Cl. 343—781 P **12 Claims**

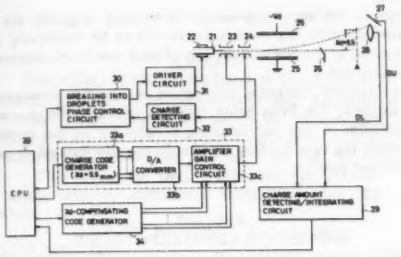


1. An orbital multi-mission spacecraft comprising a platform for receiving a plurality of removable and exchangeable payloads, each payload operating on a different electromagnetic frequency band, each payload including a respective telecommunication antenna feed system operating on one of said different frequency bands, and further comprising a telecommunication antenna system comprising a common reflector for all of said different frequency bands, said common reflector forming an integral part of said platform and cooperating with said antenna feed systems so as to receive electromagnetic energy from said feed systems or transmit electromagnetic energy to said feed systems, each of said antenna feed systems illuminating said common reflector by a respective subreflector, said subreflectors comprising a plurality of respective dichroic surfaces for selectively reflecting the frequency band of the corresponding payload and being disposed in a stack with directional adjustment relative to said common reflector and said corresponding feed system, so that each of said subreflectors illuminates said common reflector over its full aperture, said subreflectors having a common secondary focal point.

4,562,442
INK-JET PRINTING APPARATUS

Koichiro Jinnai, Kawasaki, and Masanori Horike, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Jun. 16, 1982, Ser. No. 389,079
Claims priority, application Japan, Jun. 17, 1981, 56-93637
Int. Cl.⁴ G01D *15/18*
U.S. Cl. 346—75 **4 Claims**



1. An ink-jet printing apparatus of the type in which ink droplets are charged under control to be desirably deflected when passing through a defined region where an electric field is formed, said printing apparatus comprising:

means for emitting ink droplets towards said electric field region;

charging means disposed between said emitting means and said electric field region for charging said ink droplets;

a central processing unit (CPU) for controlling the overall operation of said printing apparatus;

a charge signal generator connected between said CPU and said charging means, said charge signal generator including a charge code generator for supplying a charge code in response to a signal from said CPU, a digital-to-analog (D/A) converter which receives said charge code and converts it into an analog charge signal and an amplifier gain control circuit for amplifying said analog charge signal to apply an amplified charge signal to said charging means and said charge code generator and said amplifier gain control circuit being operative in either a deflection error compensation mode or a printing mode whereby said deflection error compensation mode, in which said charge code generator supplies a predetermined reference charge code, is first operated to determine an amplifier gain of said amplifier gain control circuit and then the printing operation is carried out using the thus determined amplifier gain as character data are supplied thereto;

deflection detecting means connected to supply information as to the amount of deflection of the ink droplets after passing through said electric field region to said CPU; and

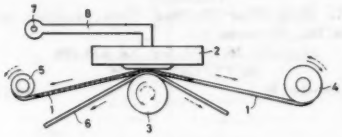
adjusting means connected to said CPU and said amplifier gain control circuit of said charge signal generator for adjusting the value of said amplifier gain in response to the information supplied from said deflection detecting means during said deflection error compensation mode.

4,562,443
THERMAL TRANSFER COLOR RECORDING APPARATUS AND RECORDING METHOD

Jyunichi Matsuno, Toride; Masataka Kawauchi, Ishioka, and Masashi Yoshida, Nakaminayo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 19, 1985, Ser. No. 724,924
Claims priority, application Japan, Apr. 20, 1984, 59-78413
Int. Cl.⁴ G01D *15/10*
U.S. Cl. 346—76 PH **7 Claims**

1. A thermal transfer color recording apparatus having a thermal head including a plurality of heat generating elements for generating heat in response to a picture signal disposed in a line, control means for controlling the heat generation of the thermal head, a platen roller arranged in opposition to the thermal head, depression means for depressing the thermal head against the platen roller, and a transfer sheet having a plurality of thermally transferrable color inks arrayed on a number of different regions of a base of the transfer sheet, so that the color inks of the transfer sheet are register-transferred to a recording medium between the thermal head and the platen roller in succession and in single-color unit by actuation

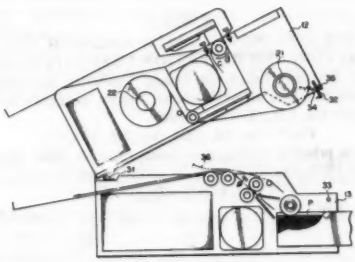


of the thermal head, transfer sheet conveyance means for conveying only said transfer sheet located between said thermal head and said platen roller, a conveyance system for conveying the recording medium and said transfer sheet placed one over the other between said thermal head and said platen roller in a forward direction and a reverse direction in synchronism with an actuation control of said thermal head as well as a drive control of said platen roller while subjecting said recording medium and said transfer sheet to a pressure of said thermal head.

4,562,444
THERMAL TRANSFER ELECTROPRINTING APPARATUS

Masayoshi Nagashima, Chigasaki, and Hiroshi Yamane, Ebina, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 16, 1983, Ser. No. 467,161
Claims priority, application Japan, Feb. 17, 1982, 57-24111
Int. Cl.⁴ G01D *15/10*; B41J *3/20*; H04N *1/21*; G03G *15/00*
U.S. Cl. 346—76 PH **16 Claims**



1. A thermal transfer type electroprinting apparatus comprising:

scanning means for scanning a document to convert the pattern of the document to pattern information;

ink medium feeding means for mounting an ink medium provided with an ink material and for feeding said ink medium along an ink medium travelling path;

paper feeding means for feeding a paper sheet along said ink medium travelling path; and

a printing section comprising thermal head means arranged along said ink medium travelling path and driven in accordance with said pattern information for selectively thermally transferring said ink material of said ink medium onto said paper sheet,

said apparatus being separable into at least first and second units along said ink medium travelling path;

wherein said first unit is a lower unit comprising said paper

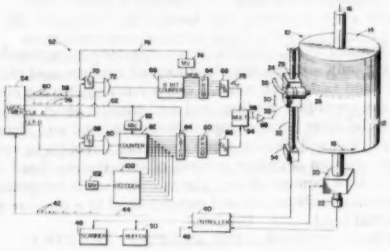
feeding means and means for guiding said paper to said ink medium travelling path; and said second unit is an upper unit incorporating said scanning means, said ink medium feeding means and said thermal head means, said first and second units being hingedly separable along said ink medium travelling path.

4,562,445

APPARATUS AND METHOD FOR DRIVING INK JET PRINTER

Leonard G. Rich, West Hartford, Conn., assignor to Metromedia, Inc., Secaucus, N.J.

Filed Jul. 26, 1984, Ser. No. 634,499
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—140 R **14 Claims**



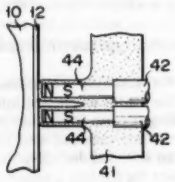
1. A circuit for driving an ink jet printer head in response to timing pulses which may appear with variable amounts of time between successive ones of such pulses, said circuit comprising, an ink jet printer head, a source of timing pulses, means for generating a fundamental waveform of finite duration in response to each of said timing pulses, means for multiplying the amplitude of each of said fundamental waveforms to provide a modified amplitude waveform in response to each of said fundamental waveforms, and means utilizing said modified amplitude waveforms to activate said ink jet printer head.

4,562,446

INK-DOT PRINTER WITH MAGNETIC INK ATTRACTING AND RETENTION PREVENTING MEANS

Tutomu Kimura; Takeyoshi Tsuge; Yoshihiro Torisawa, and Ayumu Makino, all of Mishima, Japan, assignors to Tokyo Electric Co. Ltd., Tokyo, Japan

Filed Mar. 23, 1984, Ser. No. 592,573
Claims priority, application Japan, Apr. 1, 1983, 58-56983; Apr. 12, 1983, 58-64229; Apr. 12, 1983, 58-64230
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—140 R **23 Claims**



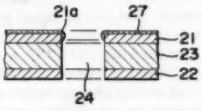
1. An ink-dot printer comprising:
magnetic ink storage means storing magnetic ink;
a pair of pole plates facing each other so as to define a slit, one-end portion of which is contacted with the magnetic ink supplied from the magnetic ink storage means;
magnetic field generating means for magnetizing the pole plates, thereby feeding the magnetic ink from the magnetic ink storage means into the slit to form a magnetic ink curtain in the slit;
a plurality of needles arranged adjacent to one another along the longitudinal direction of the slit and adapted to selectively move in the longitudinal direction thereof between a first position where one-end portion of each needle is immersed in the magnetic ink curtain in the slit between the pole plates and a second position where the one-end portion is projected from the magnetic ink curtain in the slit;
magnetic ink attracting means for causing magnetic ink in the magnetic ink curtain in the slit to be coercively attracted to the one end portion of each needle by magnetic force; and
magnetic ink retention preventing means for preventing magnetic ink from being retained between the one-end portions of any two adjacent needles by surface tension when the two needles are simultaneously located in said second position.

4,562,447

ION MODULATING ELECTRODE

Noriyoshi Tarumi, Hachioji; Haruo Iwahashi, Fussa; Masahiko Matsunawa, and Hiroshi Tokunaga, both of Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 261,029, May 6, 1981, abandoned. This application Feb. 17, 1984, Ser. No. 580,754
Claims priority, application Japan, May 22, 1980, 55-68696
The portion of the term of this patent subsequent to Jan. 17, 2001, has been disclaimed.
Int. Cl.[4] G01D *15/06*
U.S. Cl. 346—159 **4 Claims**



1. An electrostatic recording device comprising an ion generator, an electrostatic record medium and an ion modulating electrode between said ion generator and said record medium having at least one row of a plurality of apertures, which is capable of enhancing or blocking the passage of an ion flow through said apertures, and which comprises a continuous layer of a conductive material and a segmented layer of a conductive material, wherein said continuous layer and segmented layer are separated from each other by an insulating layer and have applied thereto selected voltages for modulating the ion flow, said ion modulating electrode having at least one of said continuous layer and segmented layer which is adjacent said ion generator provided with a resistance layer having a resistivity of from 10^2 to 10^8 Ωcm thereon, said resistance layer being formed so as to extend over said one layer of conductive material onto the edges around said plurality of apertures for preventing sparking between said ion generator and said one layer.

4,562,448

HEAT-SENSITIVE TRANSFER MEDIUM

Hideo Watanabe; Minoru Hakiri; Kanjirou Kawasaki, all of Numazu; Keishi Kubo, Yokohama, and Nobuhiro Takigawa, Numazu, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Oct. 17, 1984, Ser. No. 661,553
Claims priority, application Japan, Oct. 18, 1983, 58-194722
Int. Cl.[4] B41M *5/22*
U.S. Cl. 346—208 **4 Claims**

1. A heat-sensitive transfer medium comprising the combination of a transfer sheet with a receiving sheet, said tranfer sheet

being built-up by forming on a substrate a transfer layer consisting essentially of a leuco dye and a binder resin, said receiving sheet being built-up by forming on a substrate a receiving layer consisting essentially of a developer for said leuco dye and a binder resin, wherein said receiving layer and/or transfer layer is added with a porous filler whose oil absorption is 50–300 ml/100 g and further on the surface opposite to the transfer layer of the transfer sheet there is formed 0.2–5 μm-thick polyfluorocarbon-containing layer.

4,562,449

CHROMOGENIC DIHYDROQUINAZOLINES

Heinz Balli, Rieben; Sigmund Gunzenhauser, Arlesheim; Ian J. Fletcher, Magden, and Davor Bedekovic, Therwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

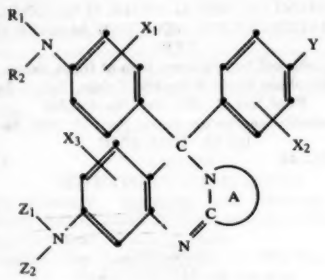
Division of Ser. No. 485,916, Apr. 18, 1983, Pat. No. 4,503,227. This application Dec. 7, 1984, Ser. No. 679,416

Claims priority, application Switzerland, Apr. 22, 1982, 2447/82

Int. Cl.⁴ B41M *5/16, 5/18, 5/22*

U.S. Cl. 346—218 **6 Claims**

1. A pressure sensitive or heat sensitive recording material which comprises a support which contains or has coated thereon, as a color former, at least one dihydroquinazoline of the formula



(I)

wherein

the ring A is a monocyclic or polycyclic, unsubstituted or substituted heterocyclic radical which contains 1 to 3 heteroatoms as ring members,

each of X_1, X_2 and Y independently of one another is hydrogen, halogen, lower alkyl, lower alkanoylamino, or a group of the formula

(1a)

or

(1b)

X_3 is hydrogen, halogen, lower alkyl or lower alkoxy;

each of R_1, R_2, R_3, R_4, Z_1 and Z_2 independently of one another is C_1–C_{12}alkyl which is unsubstituted or substituted by halogen, hydroxyl, cyano or lower alkoxy, or is cycloalkyl, phenyl, or phenyl or benzyl each substituted by halogen, nitro, lower alkyl or lower alkoxy, and R_1, R_2, R_3 and R_4 are also hydrogen; or

each pair of substituents (R_1 and R_2), (R_3 and R_4) and (Z_1 and Z_2) independently of one another, together with the nitrogen atom to which said pair is attached, is a 5- or 6-membered heterocyclic radical.

4,562,450

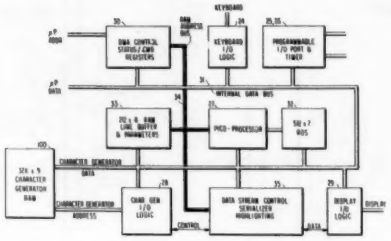
DATA MANAGEMENT FOR PLASMA DISPLAY

Joseph J. Ellis, Jr., West Hurley, and Geoffrey A. Emerson, Saugerties, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 7, 1983, Ser. No. 472,784

Int. Cl.⁴ G09G *03/28*

U.S. Cl. 340—771 **13 Claims**



1. A display management system for at least one plasma gas panel display, said at least one plasma gas panel display having a complex interface requiring the translation of display position addresses from absolute cartesian coordinates to panel addresses unique to said plasma gas panel display, said display management system comprising:

host processor means for supplying application program operations,

system microprocessor means connected to said host processor means for receiving and storing application program operations downloaded from said host processor means, said system microprocessor means further carrying out decoding and execution of commands in said application program operations downloaded from said host processor means including management of display data, and

at least one plasma display adapter means for providing high level control of said interface to said gas panel display, for serialization of character data, and for translation of display position addresses from absolute cartesian coordinates specified by said system microprocessor to panel addresses,

wherein said at least one plasma display adapter means includes picoprocessor means for computing said translation of absolute cartesian coordinates to panel addresses.

4,562,451

SEMICONDUCTOR DEVICE HAVING A RESISTOR REGION WITH AN ENHANCED BREAKDOWN VOLTAGE

Mamoru Fuse, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 385,959, Jun. 7, 1982. This application Apr. 30, 1985, Ser. No. 727,623

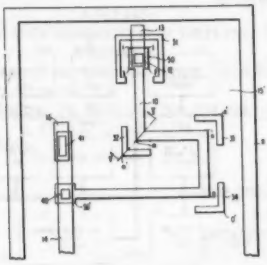
Claims priority, application Japan, Jun. 5, 1981, 56-86586

Int. Cl.⁴ H01L *29/90*

U.S. Cl. 357—13 **3 Claims**

1. A semiconductor device, comprising: a semiconductor layer of one conductivity type, an isolation region of the opposite conductivity type electrically separating said semiconductor layer into a plurality of island regions, a resistor region of opposite conductivity type formed in one island region, said one island region being supplied with a bias potential to reverse-bias said resistor region, said resistor region being elongated and bent at least once in a plan view to form a convex corner associated with a pair of straight P-N junction portions, said resistor region having one end portion supplied with a first potential and the other end portion supplied with a second potential higher than said first potential to produce a voltage drop along said resistor region, said voltage drop causing a reverse-bias voltage applied to one of said straight P-N junc-

tion portions to be larger than a reverse-bias voltage applied to the other of said straight P-N junction portions, and at least one additional region of said opposite conductivity type formed in said one island region adjacent to said convex corner and having a first arm extending partially along said one of said straight P-N junction portions and a second arm extending



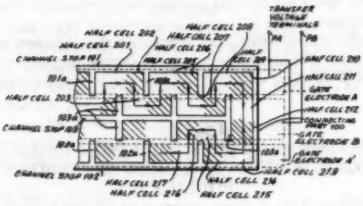
partially along said other of said straight P-N junction portions, said additional region being positioned at a distance from said convex corner such that at least one part of a space charge region extending from said one of said straight P-N junction portions reaches at least one portion of said first arm of said additional region before an avalanche breakdown occurs at said convex corner.

4,562,452

CHARGE COUPLED DEVICE HAVING MEANDERING CHANNELS

Kunihiro Tanikawa, Akashi, and Osamu Ohtsuki, Kobe, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 787,759, Apr. 15, 1977, abandoned. This application Nov. 24, 1978, Ser. No. 963,922
Claims priority, application Japan, Apr. 15, 1976, 51-43371
Int. Cl.[4] H01L *29/78*; G11C *19/28*
U.S. Cl. 357—24 **1 Claim**



1. A charge coupled device having a semiconductor substrate and at least two charge transfer routes on the substrate mutually connected at a predetermined angle, each of the charge transfer routes comprising a pair of spaced parallel band-shaped channel stops formed on said substrate and defining a charge transfer area therebetween, a plurality of short channel stops alternately extending from each of the band-shaped channel stops toward the center of the charge transfer area, each of the channel stops being a barrier to prevent the transfer of charge, a plurality of cells, each comprising a small area between next-adjacent ones of the short channel stops of a corresponding one of the band-shaped channel stops, said cells being staggered along said charge transfer route, depletion layer forming means for forming an asymmetrical depletion layer in each of the cells in a regular arrangement to determine a transfer direction of the charge, an insulative film covering the charge transfer area, a pair of elongated parallel gate electrodes on the insulative film and having transfer voltages applied thereto to induce charge storage sites whereby charges are transferred along said charge transfer route in each channel, one of the gate electrodes commonly covering the cells of one of the band-shaped channel stops and the other of the gate electrodes commonly covering the cells of the other of the band-shaped channel stops thereby forming a single directional meander-shaped charge transfer channel in the charge transfer area under said pair of gate electrodes, said charge coupled device comprising

first cells and end cells in each of said charge transfer routes, the end cell of each of said charge transfer routes having an applied potential of one phase and the first cell of the other of said charge transfer routes having an applied potential of another phase, said end and first cells being coupled at right angles in a coupling area, each of said gate electrodes being bent back on itself on the coupling area and extending continuously toward said charge transfer routes, and four of said charge transfer routes being mutually coupled to form a loop having three coupling areas, said loop surrounding an area defined thereby; and

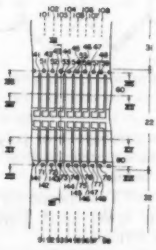
a bonding pad in the area surrounded by said loop for electrical connections.

4,562,453

COMPLEMENTARY METAL-OXIDE SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE OF MASTER SLICE TYPE

Teruo Noguchi, and Isao Ohkura, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 8, 1982, Ser. No. 440,163
Claims priority, application Japan, Nov. 25, 1981, 56-191091
Int. Cl.[4] H01L *27/02*
U.S. Cl. 357—44 **7 Claims**



1. A complementary metal-oxide semiconductor master slice integrated circuit having at least a gate array arrangement of a master slice type, comprising an internal functional gate region (22) for structuring logical gates and wiring zones (31, 32) adjacent to said internal functional gate region (22) in which positions (91~98, 101~108) where inputs and outputs of said logical gates are to be wired are predetermined, comprising

a plurality of basic cells (41, 141; 42, 142; . . .) formed in said internal functional gate region (22), each basic cell comprising a single P-channel metal-oxide semiconductor (41, 42, . . .) and a single N-channel metal oxide semiconductor (141, 142, . . .) which are arrayed in a linear manner throughout an electrical isolation region,

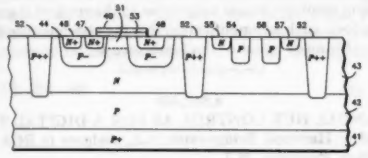
said plurality of basic cells (41, 141; 42, 142; . . .) being disposed in a transverse direction of said internal functional gate region (22), without disposing any electrical isolation regions therebetween, so that said positions (91~98, 101~108) in said wiring zones (31, 32) define said basic cells in a one-to-one manner in a longitudinal direction or a transverse direction of said internal functional gate region (22).

4,562,454

ELECTRONIC FUSE FOR SEMICONDUCTOR DEVICES

Warren J. Schultz, Tempe, and Herbert A. Saladin, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 29, 1983, Ser. No. 566,766
Int. Cl.[4] H01L 27/02, 9/02; H02H 9/00
U.S. Cl. 357—51 20 Claims



1. An electronic fuse including an input terminal, an output terminal, and a supply voltage terminal, comprising:

input means coupled to said input terminal for providing a signal when current is applied to said input terminal;

gate means comprising a PNP transistor having an emitter coupled to said input terminal, a first collector coupled to said output terminal, and a base responsive to said signal for allowing current to pass between said input terminal and said output terminal;

shorting means coupled between said output terminal and said supply voltage terminal for shorting current therebetween; and

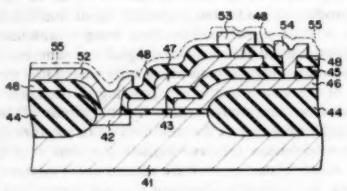
triggering means coupled to said input terminal, said gate means and said shorting means for triggering said shorting means and preventing said gate means from responding to said signal when said current exceeds a predetermined value.

4,562,455

SEMICONDUCTOR ELEMENT

Katsuya Okumura, Yokohama, and Motosuke Miyoshi, Fujisawa, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 313,960, Oct. 22, 1981. This application May 2, 1984, Ser. No. 604,612
Claims priority, application Japan, Oct. 29, 1980, 55-151941
Int. Cl.[4] H01L 23/48, 29/40
U.S. Cl. 357—71 3 Claims



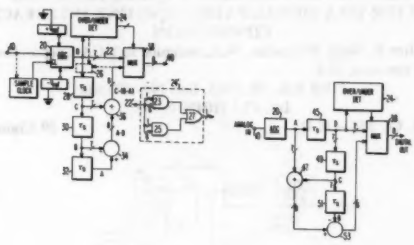
1. A semiconductor element comprising interconnection layers at various levels a pad for providing a contact with an exterior electrical connection and a probing pad for measuring the potential of a desired potential measuring section of an interconnection layer within said semiconductor element; said probing pad being made of electroconductive material; said probing pad being electrically connected through a contact hole to said desired potential measuring section of an interconnection layer covered with a first insulating layer; said probing pad being disposed at a level equal to, or higher than, an uppermost interconnection layer and isolated from other interconnection layers except said first-mentioned interconnection layer; and said probing pad being completely covered with a second insulating layer.

4,562,456

ANALOG-TO-DIGITAL CONVERSION APPARATUS INCLUDING A CIRCUIT TO SUBSTITUTE CALCULATED VALUES WHEN THE DYNAMIC RANGE OF THE CONVERTER IS EXCEEDED

Thomas V. Bolger, Merchantville, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 17, 1983, Ser. No. 542,706
Int. Cl.[4] H03K 13/175
U.S. Cl. 358—13 8 Claims



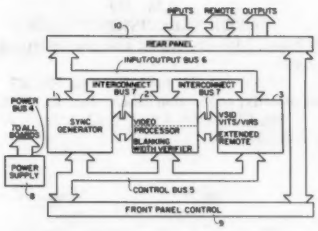
1. Apparatus for converting analog signal to digital sample format, comprising: an analog-to-digital converter biased to have a dynamic range less than the dynamic range of said analog signal; means for detecting saturated digital samples produced by said converter which correspond to analog signals exceeding the dynamic range of said converter, means for calculating digital sample values from regularly occurring digital samples taken proximate to said saturated samples and means for substituting said calculated digital samples for said saturated samples produced by said converter.

4,562,457

SYNC GENERATOR, VIDEO PROCESSOR

Frank Salvia, Old Bethpage, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Dec. 23, 1982, Ser. No. 452,809
Int. Cl.[4] H04N 9/45, 9/455
U.S. Cl. 358—19 12 Claims



1. In a color video system, a sync generator video processor comprising

a single compact multi-function video processing unit including a sync generator for driving a video source, said sync generator having horizontal and sub-carrier phasing control means;

a video processor for providing video functions, said video processor including color field identifications, blanking width verification and output equalization;

a power supply;

a front panel control;

a rear panel; and

a bus system interconnecting said sync generator and said video processor, said bus system including a power bus

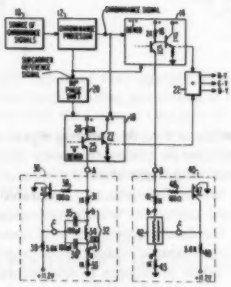
connecting said power supply to said sync generator and to said video processor, a control bus connecting said sync generator and said video processor to said front panel control, an input/output bus connecting said sync generator and said video processor to said rear panel and an interconnect bus interconnecting said sync generator and said video processor.

4,562,458

CIRCUIT FOR COUPLING A THREE TERMINAL FILTER TO A SIGNAL PATH USING ONE INTERFACE CONNECTION

Walter E. Sepp, Princeton, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Feb. 28, 1983, Ser. No. 470,618
Int. Cl.[4] H04N 9/535
U.S. Cl. 358—21 R **29 Claims**



1. In combination with a signal processing system including a signal coupling path, apparatus comprising:

an electrical signal filter of the type comprising two signal ports and three terminals and exhibiting a transfer function, determined by the structure of said filter, between said signal ports; and

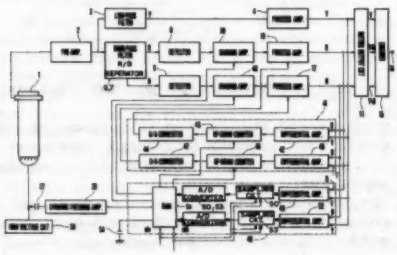
means for coupling said filter to said signal path via a single interface terminal, to effect filtering of signals conveyed by said signal path with said transfer function of said filter.

4,562,459

COLOR TELEVISION CAMERA

Hiroichi Sokei, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 21, 1983, Ser. No. 506,307
Claims priority, application Japan, Jun. 23, 1982, 57-106951
Int. Cl.[4] H04N 9/535, 9/62, 5/14, 5/34
U.S. Cl. 358—27 **1 Claim**



1. An NTSC system color television camera with a shading correction circuit, said correction circuit comprising:

differential amplifier means for comparing a level difference between Y and R signals and between Y and B signals to produce analog difference signals;

analog-to-digital converter means for converting levels resulting from sampling said analog signals by clock pulses corresponding to individual regions into which the screen of the tube is divided into digital signals;

a random access memory for storing and reading said digital signals in synchronism with said clock pulses; and

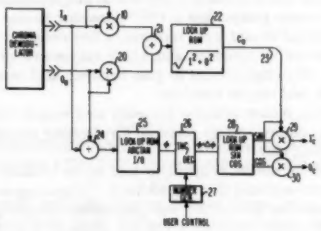
shading amplifier means responsive to the readout signals to perform such an amplification that the chrominance signal level is made equal to the luminance signal level.

4,562,460

MANUAL HUE CONTROL AS FOR A DIGITAL TV

Leopold A. Harwood, Bridgewater, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 21, 1983, Ser. No. 487,082
Int. Cl.[4] H04N 9/64
U.S. Cl. 358—28 **11 Claims**



1. In a television receiver including a source of first and second demodulated quadrature related color mixture signals, apparatus for manually changing the hue determined by said color mixture signals, comprising:

means responsive to user stimulus and said source for generating first and second control signals;

first means coupled to said source of color mixture signals and responsive to said first control signal for generating the product of said first control signal times said first color mixture signal, said product being representative of a modified first color mixture signal;

second means coupled to said source of color mixture signals and responsive to said second control signal for generating the product of said second control signal times said second color mixture signal, said product being representative of a modified second color mixture signal and wherein said first and second control signals are so interrelated that the magnitude of the vector sum corresponding to the color mixture signals from said source equals the magnitude of the vector sum corresponding to the modified color mixture signals.

9. In a television receiver including a source of first and second demodulated quadrature related color mixture signals, apparatus for manually changing the hue determined by said color mixture signals, apparatus for manually changing the hue determined by said color mixture signals comprising:

means responsive to the color mixture signals for generating a signal corresponding to the angle ϕ between the vector sum of the color mixture signals and an axis of one of the color mixture signals;

means responsive to user stimulus for incrementing or decrementing the signal corresponding to said angle;

means responsive to the signals corresponding to said incremented or decremented angles $\phi \pm \Delta\phi$ for generating signals corresponding to the sines and cosines of said angles;

means responsive to the color mixture signals for generating a signal, C, corresponding to the vector sum of the color mixture signals;

a first multiplier responsive to the signal C and the signal

corresponding to the sine of $\phi \pm \Delta\phi$ for generating a corrected color mixture signal C sin ($\phi \pm \Delta\phi$); and

a second multiplier responsive to the signal C and the signal corresponding to the cosine of $\phi \pm \Delta\phi$ for generating a second corrected color mixture signal C cos ($\phi \pm \Delta\phi$).

4,562,461

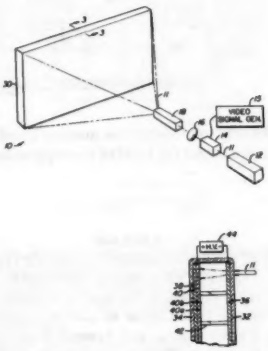
DISPLAY APPARATUS AND METHOD THEREFOR

Ronald L. Yin, 2045 Sea Cliff Way, San Bruno, Calif. 94066

Continuation-in-part of Ser. No. 309,820, Oct. 8, 1981, abandoned. This application Sep. 24, 1982, Ser. No. 422,741

Int. Cl.⁴ H04N *5/74*

U.S. Cl. 358—60 **36 Claims**



1. A method of converting an electrical signal into a visual display, said method comprising:

generating a beam of light;

modulating said beam by said electrical signal to produce a modulated beam;

optically masking said modulated beam by an optical mask to produce a masked modulated beam;

impinging said masked modulated beam at a two dimension photocathode screen in an evacuated envelope;

releasing electrons from said photocathode screen in response to said masked modulated beam;

accelerating said electrons to a two dimension phosphor screen in said envelope, said phosphor screen defining a plurality of pixels;

releasing visible light from said phosphor screen in response to electrons impinging thereon; and

moving said modulated beam causing said masked modulated beam to impinging said photocathode screen in different locations;

whereby said masked means reduces cross-talk between adjacent pixels and the movement of said masked modulated beam forms said visual display on said phosphor screen.

4,562,462

COLOR LASER PRINTER WITH IMPROVED EFFICIENCY

Richard G. Egan, Dover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 2, 1983, Ser. No. 529,104

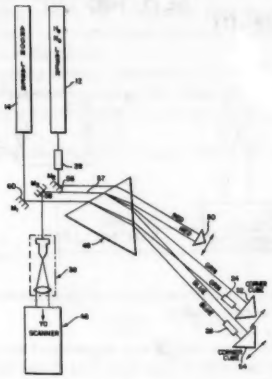
Int. Cl.⁴ H04N *1/46;* **G01D** *9/42;* **G02B** *27/14*

U.S. Cl. 358—75 **8 Claims**

1. In a multispectral laser printing apparatus of the type in which at least two laser beams of different spectral characteristics are provided from a single laser beam and comprising means for photomodulating each laser beam in response to an electrical signal representative of that spectral characteristic of an image to be printed, and exposure means for line scanning a photosensitive material with the modulated laser beams in order to print the image onto the photosensitive material, the improvement comprising:

a single light refracting optical element; and

means for redirecting each of the laser beams wherein said single light refracting optical element receives the single



laser beam and disperses the received laser beam to provide at least the two laser beams therefrom; and said single light refracting optical element is structured and situated to thereafter combine the two laser beams redirected thereto into a single multispectral beam which is thereafter directed to the exposure means.

4,562,463

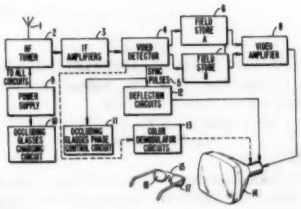
STEREOSCOPIC TELEVISION SYSTEM WITH FIELD STORAGE FOR SEQUENTIAL DISPLAY OF RIGHT AND LEFT IMAGES

Lenny Lipton, Point Richmond, Calif., assignor to Stereographics Corp., San Rafael, Calif.

Filed May 15, 1981, Ser. No. 263,944

Int. Cl.⁴ H04N *9/54, 9/60*

U.S. Cl. 358—88 **9 Claims**



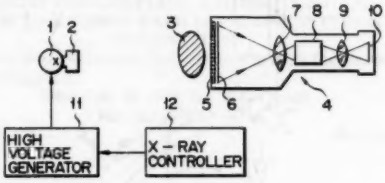
1. An apparatus for taking and sending stereoscopic television pictures comprising: first and second television cameras spaced a predetermined distance apart for taking at least first and second respective and simultaneous video fields of the same scene, a delay circuit for accumulating at least a video field from one of said cameras; and means for sequentially transmitting the undelayed and delayed video fields such that at any given time only a single video field from a single video camera is transmitted.

4,562,464

X-RAY DIAGNOSTIC APPARATUS

Tetsuro Kurihara, Ootawara, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 22, 1982, Ser. No. 452,405
Claims priority, application Japan, Jan. 8, 1982, 57-1401
Int. Cl.⁴ H04N *5/32*
U.S. Cl. 358—111 **6 Claims**



1. An X-ray diagnostic apparatus for diagnosing a curvature of vertebrae comprising:

an X-ray tube;

means for converting X-rays transmitted through an object irradiated with X-rays from said X-ray tube into visible light rays;

means for intensifying the visible light rays;

means for sensing an image contained in the output light rays from said intensifying means and converting it into first video signals;

image processing means for image processing the output signals from said image sensing means to intensify the image;

means for picking up a posture of the object to produce second video signals representing the posture;

means for composing the output signals from said image processing means and the output signal from said picking up means, the composing means including means for extracting the components of the images corresponding to the video signals produced from said image processing means and picking up means which fall on said images, within a predetermined range in a predetermined direction, and mixing means for differentiating the timings of the extracted component video signals one from another and for mixing them;

display means for simultaneously displaying the X-ray image and the posture image on the screen side by side in a horizontal direction on the basis of the output signals from said composing means; and

a timing controller for timing the operation of the whole system.

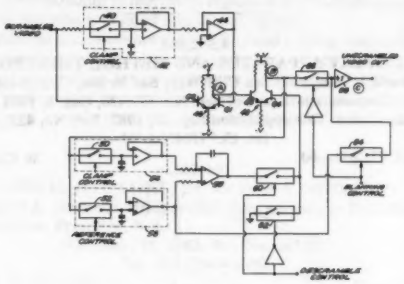
4,562,465

ADAPTIVE VIDEO DESCRAMBLING SYSTEM

Joseph B. Glaab, New Hope, Pa., assignor to General Instrument Corporation, New York, N.Y.

Filed Jun. 14, 1983, Ser. No. 504,177
Int. Cl.⁴ H04N *7/167*
U.S. Cl. 358—120 **18 Claims**

1. A television decoder for descrambling a scrambled video signal in which the synchronizing signals are suppressed and which includes an unsuppressed reference level occurring during a preset reference interval, said decoder comprising an input terminal for receiving the scrambled video signal, first means operatively connected to said input terminal for detecting the level of the suppressed synchronizing signal, second means operatively connected to said input terminal for detecting the unsuppressed reference level, means operatively connected to said first and second level detecting means for operatively comparing the suppressed synchronizing level and said unsuppressed reference level and for producing an error signal having an amplitude proportional to the difference between the suppressed synchronizing level and said unsuppressed reference level, and means operatively connected to the output of said comparing means for applying said error signal to a second level establishing means in advance of said first detecting means, thereby to modify by an amount based on the amplitude of said error signal the level of the suppressed synchronizing signals.

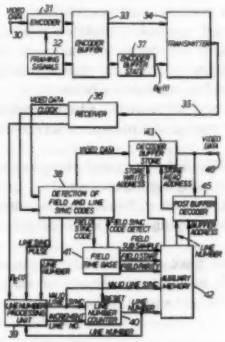


4,562,466

DIGITAL DATA TRANSMISSION/RECEPTION HAVING ADAPTIVE ERROR CONTROL

Craig S. K. Clapp, Bracknell; Norman L. Shilston, Maidenhead, both of England; Jean-Claude R. Jolivet, Lannion; Daniel P. Devimeux, Perros Guirec, and Armand Riou, Lannion, all of France, assignors to British Telecommunications, London, England

Filed Jul. 25, 1983, Ser. No. 516,707
Claims priority, application United Kingdom, Jul. 23, 1982, 8221406
Int. Cl.⁴ H04N *7/12*
U.S. Cl. 358—133 **17 Claims**



1. A method of achieving adaptive error control in the transmission and reception of conditional replenishment digital video data, said method comprising the steps of:

generating and transmitting conditional replenishment digital video data including line and frame synchronization control data which includes consecutively ordered line address indicia and consecutively ordered picture element address indicia along a given line in a predetermined raster scanning sequence for a given video image frame;

receiving said data and pre-processing it to detect the expected consecutively ordered occurrences of said indicia;

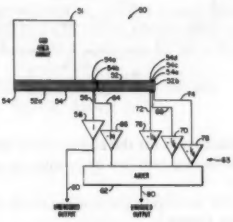
further processing said received data if the expected consecutively ordered occurrences are not detected so as to compensate therefore; and

updating a video image display using said further processed received data.

4,562,467
DATA COMPRESSION APPARATUS AND METHOD FOR ENCODING AND DECODING MULTI-LINE SIGNALS

William C. Bradley, Sudbury, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed Apr. 1, 1983, Ser. No. 481,222
Int. Cl.[4] H04N 1/41
U.S. Cl. 358—135 7 Claims



1. Apparatus for encoding a signal representing a two-dimensional image composed of an array of pixel values, which signal is composed of a succession of picture lines, each of which is composed of a succession of said pixel values, said apparatus comprising:

a shift register having approximately at least as many shift stages as each of said picture lines has pixel values for receiving said pixel values of said signal and for shifting each of said pixel values which it receives along its said shift stages;

subtracting means having a minuend input, at least two subtrahend inputs, and a difference output for supplying to said difference output the difference between the value supplied to said minuend input and an average of the values supplied to its said subtrahend inputs;

means for receiving from said signal and supplying to said minuend input a pixel value to be encoded;

first shift register reading means for reading a first of said pixel values from a first of said shift stages and for supplying it to a first of said subtrahend inputs said first pixel value being from the neighborhood, in said two-dimensional image, of said pixel value to be encoded and also being from the same picture line as said pixel value to be encoded;

second shift register reading means for reading at least a second of said pixel values from a second of said shift stages and supplying it to at least a second of said subtrahend inputs, said second shift stage being separated from said first shift stage by a number of shift stages approximately equal to the number of pixel values in a picture line, so that said second pixel value is from the neighborhood, in said two-dimensional image, of said pixel value to be encoded and is from a different picture line than said pixel value to be encoded.

4,562,468
ADAPTIVE PREDICTIVE CODING APPARATUS OF TELEVISION SIGNAL

Toshio Koga, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

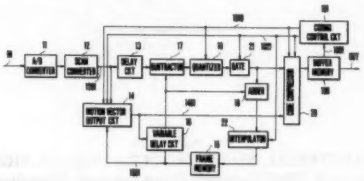
Filed May 12, 1983, Ser. No. 493,974
Claims priority, application Japan, May 14, 1982, 57-80923
Int. Cl.[4] H04N 7/13
U.S. Cl. 358—136 6 Claims

1. An adaptive predictive coding apparatus for coding an input television signal so as to perform predictive coding by determining an optimum prediction function among a plurality of prediction functions for each of a plurality of blocks obtained by dividing up a frame of the input television signal, each of the blocks having a plurality of picture elements, and to perform selection of quantizing characteristic and coding control such as subline and subsample coding, the improvement wherein said apparatus comprises:

first evaluating means for evaluating data necessary for representing a given prediction function of said plurality of prediction functions;

second evaluating means responsive to the coding control, for evaluating data necessary for representing a prediction error amount per the block for the given prediction function;

optimum prediction function output means for comparing



sums of evaluated data produced from said first and second evaluating means, in respect of at least a portion of said plurality of prediction functions, for producing and selecting, on a block by block basis, one of the prediction functions which provides a minimal sum of evaluated data quantity to be transmitted as an optimum prediction function;

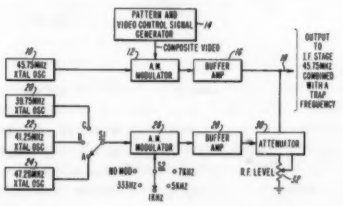
prediction coding means for effectuating predictive coding in accordance with the optimum prediction function to introduce a prediction error; and

compressor means for compression coding of at least the data representative of said optimum prediction function and data representative of the prediction error produced from said prediction coding means in accordance with said optimum prediction function.

4,562,469
METHOD AND APPARATUS FOR ALIGNING TRAPS IN A TELEVISION RECEIVER

Timothy J. Graham, Hartford, S. Dak., assignor to Sencore, Inc., Sioux Falls, S. Dak.

Filed Jul. 11, 1983, Ser. No. 512,178
Int. Cl.[4] H04N 7/02
U.S. Cl. 358—139 9 Claims



1. A method of tuning the operating frequency of a trap in the video I.F. amplifier of a television receiver, comprising the steps of

generating a video carrier having the standard video I.F. carrier frequency,

modulating said video carrier with a video pattern signal to provide a first video modulated carrier,

generating a second video carrier having the frequency to which said trap is to be tuned,

modulating said second video carrier with a video frequency signal different from said video pattern signal to provide a second video modulated carrier, applying said first and second video modulated carriers to the input of said video I.F. amplifier, and

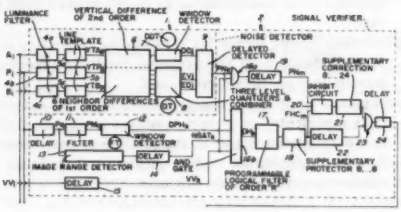
adjusting the operating frequency of said trap to attenuate the level of the video modulated second video carrier while observing said video pattern on the screen of said television receiver until any observable interference of said video frequency signal with said pattern is minimized.

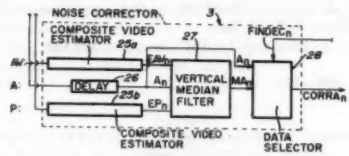
4,562,470

ELECTRICAL NOISE REDUCER FOR T.V. SIGNALS

Chom T. L. Dinh, Brossard; Roger Garceau, Pierrefonds; Marc Pastor, St-Hubert, and Gerard Terreault, Pointe-Claire, all of Canada, assignors to Centre de Recherche Industrielle du Quebec, Quebec, Canada

Filed Apr. 7, 1983, Ser. No. 482,870
Int. Cl.[4] H04N *5/21*
U.S. Cl. 358—167 **15 Claims**





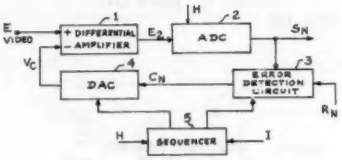
1. An electrical noise canceller system for television signals, said system comprising a noise detector circuit having three digital video delay line inputs representative of three video horizontal lines, said detector providing a binary output signal indicative of luminance calculation of pixel difference between said three inputs and having circuit means to determine if a selected one of said lines is noisy or not, a signal verifier circuit connected to said binary output signal to verify said binary output signal, said signal verifier generating an output signal indicative if a noise correction is required on said selected one of said lines, and a noise corrector circuit connected to said output signal of said signal verifier circuit and having circuit means to effect a substitution of a noisy line by a line which is a non-linear estimate of its immediate neighboring vertical video lines.

4,562,471

DIGITAL CIRCUIT FOR THE LEVEL ALIGNMENT OF AN ANALOG SIGNAL

Jean Y. Eouzan, and Robert Boyer, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Apr. 1, 1983, Ser. No. 481,240
Claims priority, application France, Apr. 2, 1982, 82 05783
Int. Cl.[4] H04N *5/18*
U.S. Cl. 358—172 **3 Claims**



1. A digital circuit for the alignment of the level of an analog input signal having porches to be aligned on a reference level comprising:

an input for receiving the analog input signal;

combining means;

an analog to digital converter coupled by said combining means to said input and having an output;

a digital output coupled to the output of the analog to digital converter;

an error detection and correction calculation circuit having a signal input connected to the digital output, having an output and having a memory circuit for storing calculated digital correction values, said memory circuit having an input coupled to the input of the error detection and correction calculation circuit and an output forming the output of the error detection and correction calculation circuit;

a sequencer for receiving an alignment pulse during the duration of each porch of the analog input signal and for controlling the error detection and correction calculation circuit in synchronism with said pulse; and

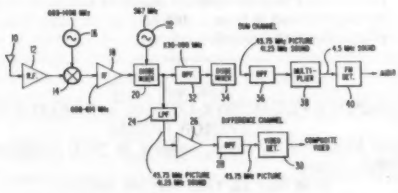
a digital to analog converter coupled to the output of the error detection and correction calculation circuit for supplying an analog correction signal maintained between two successive alignment pulses to said combining means.

4,562,472

DOUBLE CONVERSION TUNER WITH SPLIT IF OUTPUT

David J. Carlson, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 30, 1983, Ser. No. 556,447
Int. Cl.[4] H04N *5/62*; **H04B** *1/16, 1/26*
U.S. Cl. 358—197 **20 Claims**



12. Apparatus comprising:

input means for receiving an input signal having at least a first frequency component;

a local oscillator having a nominally fixed second frequency;

a first mixer coupled to said input means and said local

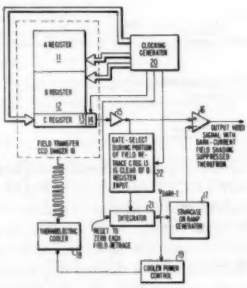
oscillator and having an output providing at least a signal having a third frequency equal to the sum of said first and second frequencies and also providing a harmonic signal of said second frequency;

a second mixer coupled to said first mixer and having an output providing a signal having a frequency of the difference between said third frequency and said harmonic frequency.

4,562,473
DARK CURRENT SENSING WITH A SOLID-STATE IMAGER HAVING A CCD LINE REGISTER OUTPUT

Peter A. Levine, Trenton, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 10, 1984, Ser. No. 659,460
Int. Cl.[4] H04N *3/14*
U.S. Cl. 358—213 6 Claims



4. A television camera for generating a video output signal having time-interleaved field trace and field retrace intervals, said television camera comprising:

a solid state imager;

an area-type image sensor included within said imager exposed to illumination during at least portions of said field trace intervals for accumulating packets of photogenerated charge as samples of an image;

means included with said imager, responsive to charge packets accumulated during each field trace interval, for supplying those charge packets a line at a time during line retrace intervals in said field trace intervals;

a CCD line register included within said imager, for receiving in respective charge transfer stages thereof respective ones of the line of charge packets thus supplied during said line retrace intervals, for serially supplying during line trace intervals time-interleaved with said line retrace intervals in said field trace intervals the charge packets received during the preceding line retrace interval, and for serially supplying charge packets of accumulated dark current free from photogenerated charge during predetermined portions of field retrace intervals;

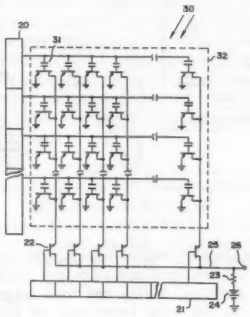
a charge sensor stage within said CCD imager for converting charge packets serially supplied from said line register to respective samples of said video output signal; and

an integrator responsive to video output signal samples supplied from said charge sensor stage responsive to its receiving from said line register the charge packets of accumulated dark current free from photogenerated charge during each of said predetermined portions of field retrace intervals, for developing a dark-current reference signal.

4,562,474
SEMICONDUCTOR IMAGE SENSOR

Jun-ichi Nishizawa, 6-16, Komegafukuro 1-chome, Sendai-shi, Miyagi 980, Japan, assignor to Jun-ichi Nishizawa, Miyagi, Japan

PCT No. PCT/JP82/00468, § 371 Date Aug. 16, 1983, § 102(e) Date Aug. 16, 1983, PCT Pub. No. WO83/02198, PCT Pub. Date Jun. 23, 1983
PCT Filed Dec. 16, 1982, Ser. No. 527,574
Claims priority, application Japan, Dec. 17, 1981, 56-204656
Int. Cl.[4] H01L *27/14*
U.S. Cl. 358—213 3 Claims



1. A semiconductor image sensor comprising:

a matrix corresponding to intersections of a plurality of row lines and a plurality of column lines on a substrate;

a static induction transistor photocell provided for each said intersection, each said photocell including

a first main electrode connected to one of the column lines,

a second main electrode connected in common to the second main electrodes of the other photocells,

a channel region disposed between the first and second main electrodes,

a control region, and

a respective capacitor connected between each said control region and a respective row line;

a respective switching transistor for each said column line, each including

a control electrode;

a first main electrode connected to the respective column line, and

a second main electrode connected in common to the second main electrodes of the other switching transistors; and

a respective video line selecting circuit for each said column line, each connected to the control electrode of the respective switching transistor; and

a respective read address circuit for each said row line, connected to the gate electrode of each respective photocell via the respective capacitor.

4,562,475
DC RESTORATION OF SYNCHRONOUSLY DETECTED CCD IMAGER OUTPUT SIGNALS

Peter A. Levine, Trenton, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 15, 1984, Ser. No. 590,035
Int. Cl.[4] H04N *3/14*
U.S. Cl. 358—213 17 Claims

4. A combination of:

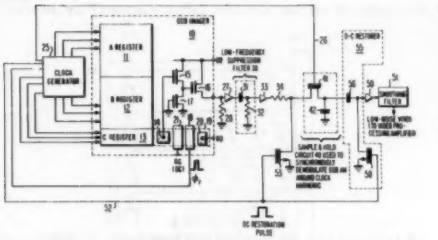
a solid-state imager from an output register of which samples of a raster-scanned output signal are supplied at a given clocking rate during line trace intervals;

a filter for providing at an output connection of said filter, a

zero-average-value response to the samples of said solid-state imager output signal received at an input connection of said filter, in which response at least the lower frequency portions of its baseband frequency spectrum are suppressed;

means for referring said zero-average-value response to an essentially noise-free signal ground;

a synchronous detector for detecting the sideband spectra of a harmonic of said clocking rate, having an input connection for the signal to be detected, an input connection for



receiving the harmonic of clocking rate as a synchronous detector carrier signal and an output connection;

means for applying, during line trace intervals said filter response to the input connection of said synchronous detector for the signal to be detected;

means for applying, during line retrace intervals, a noise-free signal level to the input connection of said synchronous detector for the signal to be detected; and

means, operative during line retrace intervals, for restoring d-c level in response to the signal supplied at the output connection of said synchronous detector.

4,562,476

AUTOMATIC DIAPHRAGM CONTROL DEVICE FOR USE IWT CCTV CAMERA

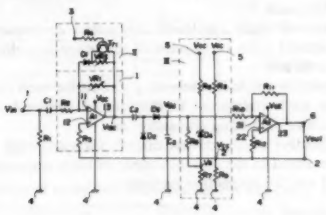
Tohru Shikano; Terumi Ogasawara, and Masayuki Arai, all of Tokyo, Japan, assignors to Asahi Seimitsu Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 17, 1984, Ser. No. 651,078

Claims priority, application Japan, Sep. 19, 1983, 58-172752

Int. Cl.[4] H04N *5/34*

U.S. Cl. 358—228 **5 Claims**



1. An automatic diaphragm control device for use with a CCTV camera in which a video signal applied from the CCTV camera is utilized for diaphragm control, said automatic diaphragm control device comprising:

first means for continuous control of the video signal with respect to an absolute brightness of an object to be picked up;

second means for continuous control of a proportion of the video signal corresponding to a bright portion in the whole picture when a ratio of the bright portion to a dark portion of this object is relatively high; and

third means for stabilization of a control signal, which has been obtained by said first and second means and then rectified, with respect to a source voltage.

4,562,477

AUTOMATIC DIAPHRAGM CONTROL DEVICE FOR USE WITH CCTV CAMERA

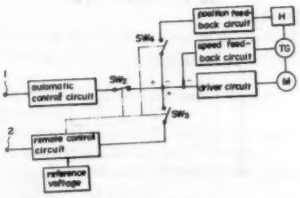
Terumi Ogasawara; Masayuki Arai, and Tohru Shikano, all of Tokyo, Japan, assignors to Asahi Seimitsu Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 17, 1984, Ser. No. 651,077

Claims priority, application Japan, Sep. 26, 1983, 58-177828

Int. Cl.[4] H04N *5/34*

U.S. Cl. 358—228 **6 Claims**



1. A remote-controllable automatic diaphragm control device for use with a CCTV camera including not only automatic diaphragm control means adapted for diaphragm control utilizing a video signal coming from a television camera but also remote diaphragm control means adapted for electrical adjustment of the diaphragm to a desired diaphragm position independently of said video signal, said diaphragm control device comprising:

a driver circuit adapted to drive a diaphragm drive motor to open and close the diaphragm;

an automatic control circuit to apply said driver circuit with a control signal based on the video signal coming from the television camera;

first means provided in said automatic control circuit for continuous control of the video signal with respect to an absolute brightness of an object to be picked up;

second means provided in said automatic control circuit for continuous control of a proportion of the video signal corresponding to a bright area in the whole picture when a ratio of the bright area to a dark area of this object is relatively high;

a remote control circuit to apply said driver circuit with a diaphragm position control signal exclusively for the remote diaphragm control;

a position feedback circuit to detect a position to which the diaphragm has been driven by the diaphragm drive motor and thereby to electrically fix the diaphragm;

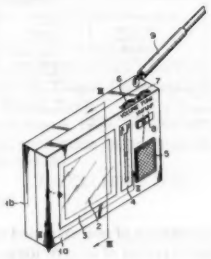
a switching circuit for selective connection of said automatic control circuit or said remote control circuit to said driver circuit depending on the position control signal applied to said remote control circuit whether it is higher or lower than a predetermined reference voltage and further for connection of said position feedback circuit to the driver circuit only when said driver circuit is connected to the remote control circuit; and

a stabilizer for stabilization of a control signal obtained by said automatic diaphragm control means and a detection signal fed back from a position detector element in said remote diaphragm control means with respect to a source voltage so that the diaphragm value once adjusted under a given source voltage may be held constant.

4,562,478
LIQUID CRYSTAL TELEVISION RECEIVER

Yukinori Hirasawa, and Osamu Kameda, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Feb. 14, 1983, Ser. No. 466,209
Claims priority, application Japan, Feb. 18, 1982, 57-25144
Int. Cl.[4] H04N 5/70; G02F 1/135, 1/19
U.S. Cl. 358—236 11 Claims



1. A liquid crystal television receiver, comprising:

a television circuit;

a liquid crystal display panel coupled to said television circuit for producing a television picture image on a front side thereof;

light illuminating means facing a reverse side of said liquid crystal display panel opposite said front side for emitting light through and out of the front side of said panel;

a tuning detection circuit for detecting a tuned state wherein said television circuit is tuned to a television signal wave;

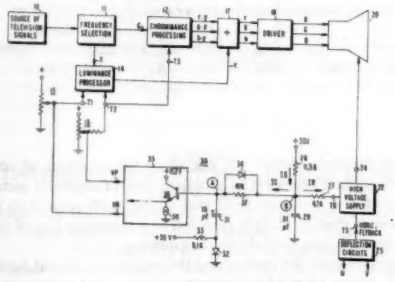
a driving circuit adapted to drive said light illuminating means to permit light emission only when said tuning detection circuit detects said tuned state; and

a case for holding said television circuit, liquid crystal display panel, light illuminating means, tuning detection circuit and driving circuit in operative relation therein.

4,562,479
AUTOMATIC KINESCOPE BEAM CURRENT LIMITER

James A. McDonald, Carmel, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 26, 1984, Ser. No. 603,936
Int. Cl.[4] H04N 5/68, 9/16
U.S. Cl. 358—243 11 Claims



1. In a video signal processing system including a video signal channel, and a current-conducting image display device responsive to video signals received from said video channel; control apparatus comprising:

a source of signal representative of the magnitude of current conducted by said display device in response to said video signals, said representative signal being provided at a sense point;

filter means;

means for coupling a control voltage developed by said filter means to a control input of said video channel; and

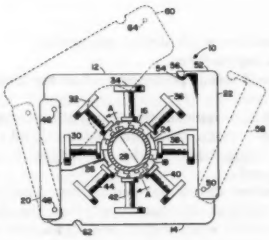
a current path including threshold conduction means for coupling said representative signal from said sense point to said filter means for causing said filter means to develop said control voltage related to the magnitude of said representative signal; said threshold conduction means exhibiting first and second conductive states as a function of the magnitude of said representative signal;

wherein said threshold means when exhibiting said first conductive state causes said control apparatus to exhibit a first response time related to a first value of the impedance of said current path; and when exhibiting a second conductive state causes said control apparatus to exhibit a relatively faster second response time related to a modified, second value of impedance of said current path.

4,562,480
MOUNTING APPARATUS FOR DYNAMIC CONVERGENCE COILS

Jungho Pak, Beaverton, and Jaime A. Navia, West Linn, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Nov. 14, 1983, Ser. No. 551,432
Int. Cl.[4] H04N 5/645
U.S. Cl. 358—248 12 Claims



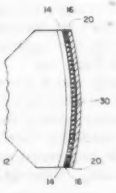
10. An apparatus for perpendicular attachment of a planar object to a cylindrical object, said apparatus comprising:

a grommet disposed between said planar and cylindrical objects, said grommet being composed of an elastomeric material, said grommet having a plurality of suction cups disposed on one side for contacting said cylindrical object, and also having a grooved portion disposed on the opposite side for contacting said planar object.

4,562,481
OVERLAY FOR CATHODE RAY TUBE DISPLAY

Theodore C. Trakas, 7407 Meadow Cliff, San Antonio, Tex. 78251

Filed Sep. 30, 1982, Ser. No. 430,935
Int. Cl.[4] H04N 5/72
U.S. Cl. 358—252 6 Claims



1. An overlay for the display face of a CRT comprising:

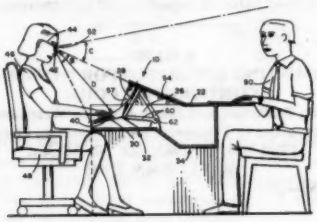
(a) An overlay panel conforming in contour to the CRT display face, and disposed in laminal, spaced relation to the display face;
(b) Transparent, rigid, substantially spherical particles of a predetermined size interposed between said overlay panel and the CRT display face such that a substantially uniform gap is maintained between them; and
(c) Means for securing the edges of said overlay panel to the CRT display face.

4,562,482

COMPUTERIZED EXECUTIVE WORK STATION

Robert L. Brown, 8350 Los Coyotes Dr. #13, Buena Park, Calif. 90621

Filed Jul. 29, 1983, Ser. No. 518,369
Int. Cl.⁴ H04N *5/64*
U.S. Cl. 358—254 **6 Claims**



1. An executive work station comprising:
(a) a desk top surface;
(b) keyboard means positioned below the level of said desk top surface;
(c) display screen means positioned at an acute angle to said desk top surface, the bottom edge of said display screen means being adjacent the top edge of said keyboard means; and
(d) said screen means and said keyboard means being positioned substantially equidistantly from the eyes of a person seated at said work station, and said screen and keyboard means, when so positioned, being substantially within the angle subtended by the near portion of bifocal eyeglasses worn by said person when the field of view of the far portion thereof is sutstantially horizontal.

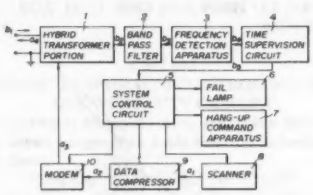
4,562,483

TRANSMISSION INTERRUPTION SIGNAL DETECTION SYSTEM

Hiroshi Kurokawa, Yokohama; Sunji Kurokawa, Sagamihara, and Yuichi Saito, Machida, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 7, 1979, Ser. No. 73,291
Claims priority, application Japan, Sep. 9, 1978, 53-110237
Int. Cl.⁴ H04N *1/32*
U.S. Cl. 358—257 **8 Claims**

1. In a facsimile apparatus capable of transmitting image information from transmission apparatus to reception apparatus and, in the meantime, capable of producing a transmission interruption signal of a predetermined frequency and sending the same continuously for a predetermined period of time from the reception apparatus to the transmission apparatus when the reception apparatus is hung up, a transmission interruption signal detection system in which a hybrid transformer apparatus and clock signal count means are provided in said transmission apparatus, and transmission of the image information and reception of said transmission interruption signal are performed through said hybrid transformer apparatus, whereby the signal level of the image information is lowered to a much larger extent than the transmission interruption signal, and signals having said predetermined frequency are extracted from signals obtained during transmission of said image information through said hybrid transformer apparatus and by controlling said clock signal count means by said extracted



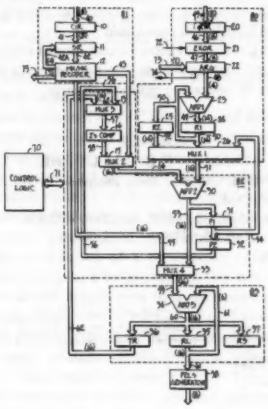
signals, when the generation of said extracted signals continues for said predetermined period of time or longer, said transmission interruption detection signal is produced.

4,562,484

METHOD AND DEVICE FOR DECODING TWO-DIMENSIONAL FACSIMILE SIGNALS

Krishna Rallapalli, San Jose, and Shinkyo Kaku, Los Gatos, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Aug. 19, 1983, Ser. No. 524,816
Int. Cl.⁴ H04N *1/40*
U.S. Cl. 358—261 **13 Claims**



1. A facsimile device for decoding the positions of color change picture elements in a coding line of digitized picture data coded in a sequence of codewords with respect to the position of change picture elements in a reference line of digitized picture data, said device comprising
a control logic for controlling the operations of said device;
first means, coupled to said control logic and responsive to said reference line picture data, for sequentially generating in parallel the accumulated run lengths of each color change picture element in said reference line;
second means, coupled to said control logic and responsive to said codewords, for generating displacement values;
third means, coupled to said control logic, first and second means, for combining said reference line accumulated run

lengths and said displacement values to sequentially generate the accumulated run lengths of change picture elements in said coding line; and

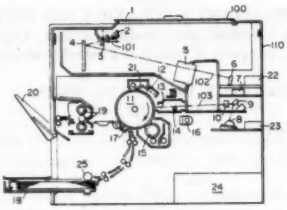
fourth means, coupled to said control logic and said third means, for generating the difference in accumulated run lengths for consecutive color change picture elements in said coding line to generate the run lengths of color units between said consecutive color change picture elements;

whereby said generated run lengths are decoded from said codeword sequence.

4,562,485
COPYING APPARATUS

Katsuyoshi Maeshima, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 5, 1980, Ser. No. 175,449
Claims priority, application Japan, Aug. 10, 1979, 54-102479; Aug. 10, 1979, 54-102480
Int. Cl.⁴ H04N *1/40*
U.S. Cl. 358—280 **44 Claims**



1. A copying apparatus, comprising:

a member on which an original document having an image to be copied may be placed;

scanning means for scanning the image of an original document placed on said member;

memory means for storing said original image scanned by said scanning means in a state of a group of pixels;

copy mode input means for determining the type of image conversion to be used for forming a copy image on a copy material in a relationship faithful to or different from the image of the original document placed on said member;

first control means having a readout function for controlling the pixel data readout from said memory means in response to the input signal from said mode input means for effecting image conversion;

second control means for controlling the readout function of said first control means, in response to the input means for producing said image in a determined position on the copy material; and

image forming means for forming the image at the determined position on the copy material in response to the readout data thus controlled by said second control means.

4,562,486
CONVERSION OF MULTILEVEL DIGITAL DATA TO BINARY DATA

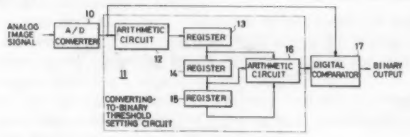
Kazuhiro Suzuki, Suntou, and Noboru Murayama, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Japan

Filed May 20, 1983, Ser. No. 496,660
Claims priority, application Japan, May 21, 1982, 57-86108
Int. Cl.⁴ H04N *1/40*
U.S. Cl. 358—282 **7 Claims**

1. A system for converting multilevel video data into binary video data using an adjustable threshold, comprising:

analog-to-digital converting means for converting analog video data obtained by scanning an original into multilevel video data;

threshold setting means connected to receive said multilevel digital video data for setting a threshold by taking a digitally weighted average of at least two averaged image densities each determined for each scanning line, said threshold setting means including a first arithmetic unit for determining an average image density for a single scanning line, a memory unit for storing two or more average image densities determined by said first arithmetic



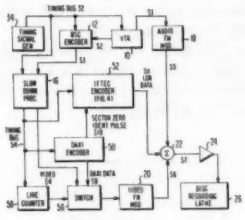
unit and a second arithmetic unit for determining a digitally weighted average of a predetermined number of average image densities stored in said memory unit, whereby said second arithmetic unit supplies said digitally weighted average as a threshold to be set; and

binary converting means for converting said multilevel video data into binary video data using said digitally weighted average as a threshold.

4,562,487
VIDEO DISC ENCODING AND DECODING SYSTEM PROVIDING INTRA-INFIELD TRACK ERROR CORRECTION

Robert N. Hurst, Jr., Hopewell, N.J., and Michael A. Plotnick, Southampton, Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Dec. 30, 1983, Ser. No. 567,252
Int. Cl.⁴ G11B *21/10*
U.S. Cl. 358—342 **4 Claims**



1. A method for forming a video disc recording signal for facilitating intra-field track error correction upon subsequent playback of disc records recorded with said disc recording signal comprising the steps of:

(a) providing a video signal inclusive of a binary data sequence representative of field numbers of said video signal;

(b) providing a subset of said data sequence representative of track identification numbers;

(c) encoding said subset by tri-phase modulation of a first carrier wave;

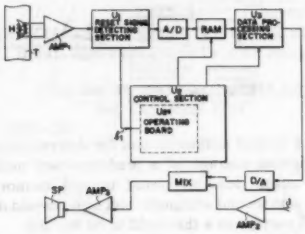
(d) frequency modulating a second carrier wave with said video signal; and

(e) combining said first and second carrier waves to form said disc recording signal.

4,562,488
DEVICE FOR REPRODUCED SOUND PITCH MODIFICATION IN A TAPE PLAYER

Reikichi Koyama, and Kikuo Usugi, both of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Jun. 28, 1983, Ser. No. 509,176
Claims priority, application Japan, Jun. 28, 1982, 57-95787[U]
Int. Cl.[4] G11B 5/00
U.S. Cl. 360—8 13 Claims



1. A pitch modification device in a tape player which comprises:

magnetic tape reproduction means for producing reproduction signals;

reset signal detecting means for detecting a signalless zone on a magnetic tape among said reproduction signals from said reproduction means and for generating a reset signal responsive to said signalless zone;

A/D conversion means for converting said reproduction signals from said reproduction means into digital signals;

memory means for accepting digital signals from said A/D converter to be written therein and to be read out therefrom;

user-operated control means for selecting from a progressive incremental range of values a fixed ratio between the write-in frequency f_w and the read-out frequency f_R of said memory means to make the read-out frequency equal to, greater than, or less than the write-in frequency, and connected to said reset signal detection means so as to supply said reset signal and for equalizing said frequencies in response to said reset signal;

D/A conversion means for converting digital signals read out from said memory means into analog signals; and

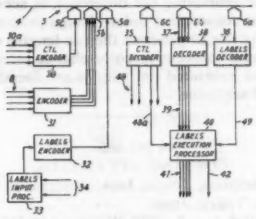
audio reproduction output means for reproducing said analog signals into audio signals.

4,562,489
APPARATUS FOR RECORDING OF DIGITAL DATA

Philip S. Gaskell, London, England; Roger Lagadec, Rumlang, Switzerland, and Guy W. McNally, Shere, England, assignors to Willi Studer AG, Regensdorf, Switzerland

Filed Aug. 24, 1984, Ser. No. 644,182
Claims priority, application United Kingdom, Aug. 26, 1983, 8323112
Int. Cl.[4] G11B 5/09, 5/02
U.S. Cl. 360—39 29 Claims

1. Apparatus for recording digital primary data corresponding to signals transmitted through one or more input data channels and recorded on one or more tracks on a recording medium, characterised by means responsive to auxiliary data attached to said primary data, said auxiliary data consisting of control instructions and information related to the said digital primary data, said means carrying out record/reading operations of said auxiliary data on at least one separate track on the recording medium and executing instructions acting upon said digital primary data and said means establishing a formatted

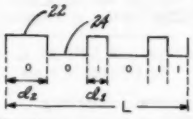


structure for the auxiliary data related to the structure of the digital primary data corresponding to the signals.

4,562,490
JACKPOT-RESISTANT MAGNETIC CARD ENCODING

Merlyn Barth, Glendale, and Joseph Kosednar, Creve Coeur, both of Mo., assignors to Interface Control Systems, Inc., St. Louis, Mo.

Filed Jan. 5, 1984, Ser. No. 568,383
Int. Cl.[3] G11B 5/09
U.S. Cl. 360—44 7 Claims



1. A method of magnetic encoding on a strip form magnetic recording medium, said method comprising selecting first and second magnetic field orientations for recordation on said medium of successive adjacent bit regions in an alternating field orientation pattern with the transition between such orientations defining the transition from one bit region to the next bit region and representing the initiation of a recorded bit representing either a binary "1" or a binary "0", selecting a first bit region length d_1 for representing one of the binary values of "1" or "0" and a second bit region length d_2 for representing the other binary value, and selecting the ratio of d_1/d_2 of a value from about 0.1 to about 0.5, whereby the magnetic field transition between adjacent bit regions signals a binary bit and the length of each bit region represents its value as a binary "1" or "0", and recording data in binary format on said medium in a data field using the bit length d_1 or d_2 and ratio d_1/d_2 so selected, said step of recording data being effected by recording such data identically in a pair of linearly spaced data fields, the method further comprising the further step of recording on said medium an additional segment of binary bits separating said data fields, whereby the total length of the recordation on said medium and thereby the center point dividing said spaced data fields cannot be determined without knowing the data represented in each of said data fields.

4,562,491
MULTICHANNEL DIGITAL MAGNETIC RECORDING APPARATUS

Masaru Kawabata; Teruo Furukawa, both of Amagasaki, and Michiyasu Ishibashi, Nagaokakyo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 15, 1983, Ser. No. 475,407
Claims priority, application Japan, Mar. 26, 1982, 57-50611
Int. Cl.[3] G11B 5/09
U.S. Cl. 360—51 17 Claims

1. A multichannel digital magnetic recording apparatus for

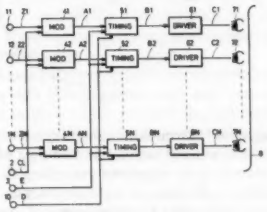
writing multichannel digital signals in multichannels on a magnetic recording medium traveling at a traveling speed V, the written digital signal in each channel represented by a train of current pulse elements having a pulse width ΔT and a period T, comprising:

a plurality (N) of thin film magnetic heads each having a gap length G_l for writing signals in said recording medium,

a power supply for said heads, and

means for reducing power requirements from said power supply, including:

a plurality (N) of modulating means for modulating said digital signals in accordance with a modulation system of a detection window Tw to provide modulated signals in the form of pulses,



a plurality (N) of input means for providing said multichannel digital signals to respective ones of said modulating means, and

a plurality (N) of timing means coupled to said modulating means and to said thin film magnetic heads, respectively, for converting each of said modulated multichannel signals in the form of pulses into said trains of current pulse elements having a pulse width ΔT and a period T, for delyaing said current pulse elements by 0, T/K, 2T/K, 3T/K, . . . , (K−1)T/K, and for providing the delayed outputs to said thin film magnetic heads, where said period T satisfies the following formula in which M is an integer satifying $M \geqq 1$, and K is an integer satifying $2 \leqq K \leqq N$:

$$T = \frac{T_w}{M} \leqq \frac{G_l + V \cdot \Delta T}{V}$$

4,562,492

NOISE REDUCTION CIRCUIT

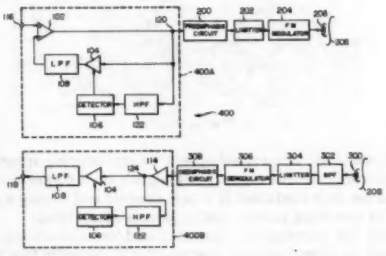
Seiji Higurashi, Chiba, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Jul. 3, 1984, Ser. No. 627,384

Claims priority, application Japan, Jul. 4, 1983, 58-103624[U]

Int. Cl.⁴ G11B *5/45, 5/62*

U.S. Cl. 360—65 **5 Claims**



1. In a noise reduction circuit having an encoder for applying to a preemphasis circuit an audio signal to be recorded on a recording medium in a recording mode of operation by compressing the audio signal, and a decoder for expanding an audio signal reproduced from the recording medium through a deemphasis circuit in a playback mode of operation, said encoder comprising:

(a) a differential amplifier responsive to the audio signal to be recorded;

(b) a first voltage control amplifier responsive to an output of said differential amplifier;

(c) a first high pass filter responsive to the output of said differential amplifier, said first high pass filter having a filtering characteristic which raises a level of the input signal thereto in a high frequency range;

(d) a first detector responsive to an output of said first high pass filter, said first detector applying an output thereof to the first voltage control amplifier; and

(e) a first low pass filter responsive to an output of the first voltage control amplifier, said first low pass filter applying an output thereof to the differential amplifier;

whereby a level of an output of the encoder is controlled relatively low in the high frequency range with respect to a level of the output thereof in the low frequency range.

4,562,493

MAGNETIC VIDEO RECORDING APPARATUS FOR INTERMITTENT RECORDING

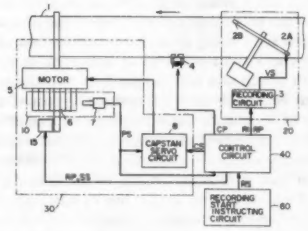
Yoshihisa Nishitani, Suita; Masateru Nakano, and Yoshihito Yamamoto, both of Nagaokakyo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

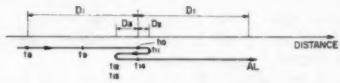
Filed Dec. 30, 1983, Ser. No. 567,173

Claims priority, application Japan, Jan. 11, 1983, 58-2967

Int. Cl.⁴ G11B *15/00*

U.S. Cl. 360—74.1 **7 Claims**





1. A magnetic video recording apparatus for making magnetic tape (1) travel intermittently so as to record a video signal (VS) therein, comprising:

magnetic tape driving means (30) for making said magnetic tape (1) travel at a predetermined speed while said magnetic tape driving means (30) is enabled,

video signal recording means (20) for recording said video signal (VS) in said magnetic tape (1) in a predetermined format while said video signal recording means (20) is enabled,

recording start instructing means (60) for providing intermittently a recording start signal (RS) for instructing a start of recording, and

control means (40) connected to said magnetic tape driving means (30), said video signal recording means (20) and said recording start instructing means (60) for enabling said mag-

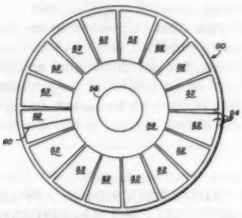
netic tape driving means (30) in response to said recording start signal (RS), enabling said video signal recording means (20) for a predetermined period of time when the travelling speed of said magnetic tape (1) attains said predetermined speed, and then disabling said magnetic tape driving means (30).

4,562,494

DISK DRIVE ALIGNMENT ANALYZER

Charles R. Bond, Milpitas, Calif., assignor to Verbatim Corporation, Sunnyvale, Calif.

Filed Apr. 7, 1983, Ser. No. 482,906
Int. Cl.[4] G11B *5/56*
U.S. Cl. 360—75 **4 Claims**



1. An alignment disk comprising:
a disk;
a coating on at least one side of said disk comprising a magnetizable material for magnetically encoding information;
a collection of information magnetically stored in said magnetizable material of said coating in a format including a plurality of data and a plurality of check sums, with the relationship between predetermined portions of said data and associated check sums being such that a comparison of said data and said check sums provides an indication as to the accuracy with which said data is read by a transducer head;
said format in which said information is stored includes a plurality of concentric tracks on said disk, one of said tracks being properly aligned and located such that a center line of said properly aligned track is at a radial distance from the center of said disk equal to the radial distance from the center of said disk of the center line of said transducer head when said transducer head is properly aligned and is positioned for reading said properly aligned track, and a plurality of said tracks are on both sides of said properly aligned track and are located with their center lines radially displaced from the center line of said properly aligned track by distances which differ from the radial distances that said transducer head is able to index by predetermined amounts.

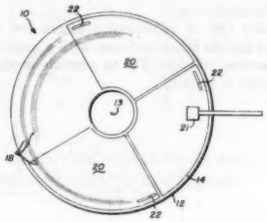
4. An alignment system comprising:
a magnetic recording media on which data may be stored by magnetization of said magnetic media;
a plurality of alignment tracks on said magnetic media in which a plurality of data is stored comprising a properly aligned track, and a plurality of nonaligned tracks for which the absolute value of the difference between the radial distance representing proper alignment and the actual radial distance of said nonaligned tracks increases with the distance each nonaligned track is from said properly aligned track; and
a plurality of program tracks on said magnetic media, the program tracks being properly aligned and containing magnetically encoded thereon a program for enabling a computer to test transducer alignment thrugh utilization of the alignment tracks on said magnetic media;
whereby the alignment of a transducer may be evaluated by testing its ability to correctly read data from said alignment tracks.

4,562,495

MULTIPLE SYSTEM DISK

Charles R. Bond, Milpitas, and Ronald M. Sturtevant-Stuart, San Francisco, both of Calif., assignors to Verbatim Corporation, Sunnyvale, Calif.

Filed Jul. 2, 1984, Ser. No. 627,238
Int. Cl.[4] G11B *23/36, 27/32, 31/00, 21/08*
U.S. Cl. 360—78 **14 Claims**



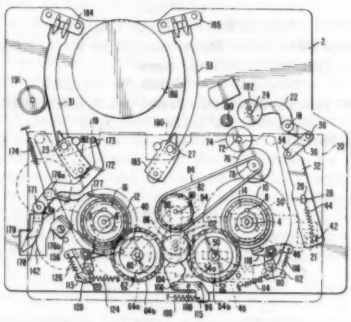
1. A magnetic information storage system comprising
a flexible disk storage medium including a base film substrate and at least one magnetic recording layer suitable for recording a plurality of separate tracks;
a plurality of headers on at least one of said tracks, each of the headers occupying a discrete angular portion of the disk and carrying an encoded sequence readable by only one of a plurality of target computers, said sequence comprising directions to the computer to load the encoded information and further to step out and to process a plurality of data tracks located elsewhere on the disk.

4,562,496

MAGNETIC TAPE RECORDING AND/OR REPRODUCING APPARATUS

Fuminari Saito, Hirakata; Jirou Kajino, Neyagawa, and Hiroshi Kanchiku, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 23, 1983, Ser. No. 468,991
Claims priority, application Japan, Feb. 25, 1982, 57-29324; Feb. 25, 1982, 57-29325; Feb. 25, 1982, 57-29326; Mar. 3, 1982, 57-33611
Int. Cl.[4] G11B *5/08, 15/00*
U.S. Cl. 360—85 **6 Claims**



1. A magnetic tape recording and/or reproducing apparatus for recording and/or reproducing signals on a magnetic tape wound on reels contained in a tape cassette and having a plurality of operating modes, said apparatus comprising:
means for carrying out recording and/or reproducing signals on/from magnetic tape moving in a specific tape path outside of the tape cassette;
a reversible motor;

a pair of reel drive turntables engageable with the reels in the cassette for rotating said reels;

loading means moved in response to rotation of said motor in one direction from an inoperative position to an operative position for drawing the magnetic tape out of the tape cassette and loading the magnetic tape in the specific tape path, and moved in response to rotation of said motor in the opposite direction back from said operative position to said inoperative position;

resilient means exerting a force on said loading means for urging said loading means firmly into said operative position and producing an opposite reaction force;

operatively mode changing means having at least one rotatable disc connected to said motor and rotatable thereby to a plurality of positions starting from a stopping position with rotation of said motor for changing the operating mode of said apparatus to operating modes corresponding to said plural positions;

driving means having a plurality of interconnected members the first of which is engageable with said rotatable disc only during a portion of the rotation thereof corresponding to the tape loading/unloading operation for being driven thereby only during tape loading/unloading operation and the last of which is engaged with said loading means for driving said loading means between said inoperative and operative positions and receiving the opposite reaction force produced by said resilient means and normally transmitting it back along a path through said interconnected members toward said rotatable disc; and

locking means on two successive members in said plurality of members for cooperation therewith so that when said driving means is in a position corresponding to the operative position of said loading means, said opposite reaction force is redirected against a preceding member out of said path for locking said plurality of members against movement, whereby when the driving means is held in the locked position, said rotatable disc is free to move relative to said driving means without any of the opposite reaction force acting on said rotatable disc.

4,562,497

TAPE DRIVE SPINDLE

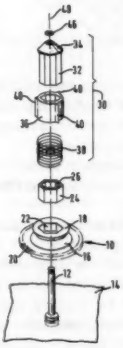
Kaoru Morinaga, Yokohama; Hiroshi Kawakami, Fujisawa, and Yoshihiro Kotoda, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed May 11, 1983, Ser. No. 493,634

Claims priority, application Japan, May 12, 1982, 57-79430

Int. Cl.⁴ G11B *15/00*

U.S. Cl. 360—96.3 **9 Claims**



1. A tape drive spindle for rotating a reel hub rotatably mounted within a cartridge tape housing, comprising;

a base member adapted for rotation about an axis thereof by a driving source;

a spindle shaft member coaxial with said base member and adapted to engage with said reel hub; and

a resilient joint member interposed between said spindle shaft member and said base member and resiliently coupling in torsion said spindle shaft member to said base member.

4,562,498

LOADING/EJECTING DEVICE FOR A MAGNETIC DISK

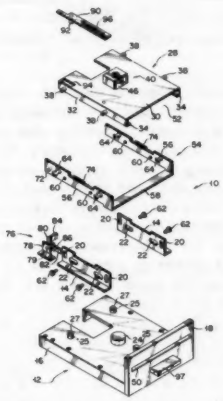
Haruo Shibata, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 1, 1983, Ser. No. 556,783

Claims priority, application Japan, Jan. 31, 1983, 58-13984

Int. Cl.⁴ G11B *17/04*

U.S. Cl. 360—97 **13 Claims**



1. A loading/ejecting device for loading and ejecting a magnetic disk into and from a magnetic disk drive apparatus which includes a chassis and driving means thereon for rotating the magnetic disk, comprising:

guide means attached to said chassis, for providing a guide on said chassis;

a holder located above said driving means and adapted to hold said magnetic disk parallel to said chassis, said holder being supported by said guide means to be linearly movable, in a direction orthogonal to said chassis, between a first position where said magnetic disk can be inserted into or ejected from said holder, and a second position where said magnetic disk can be driven by said driving means;

a loading/ejecting member supported by said guide means to be movable between an initial position and an advanced position, said loading/ejecting member moving said holder from said first position to said second position as said loading/ejecting member moves from said initial position to said advanced position, and to move said holder from said second position to said first position as said loading/ejecting member moves from said advanced position to said initial position;

locking means for engaging said loading/ejecting member, thereby locking said loading/ejecting member in said initial position;

a push member supported by said holder to be movable between first and second locations, said push member moving from said first location to said second location, in conjunction with insertion of the magnetic disk into said holder, thereby pushing said locking means to be disengaged from said loading/ejecting member; and

an operating member capable of pushing said loading/ejecting member toward said initial position.

4,562,499

MAGNETIC DISK UNIT

Yoshifumi Mizoshita, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

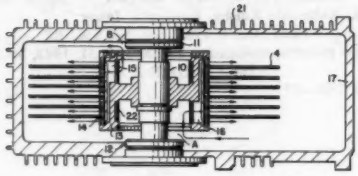
PCT No. PCT/JP81/00297, § 371 Date Jun. 21, 1982, § 102(e) Date Jun. 21, 1982, PCT Pub. No. WO82/01616, PCT Pub. Date May 13, 1982

PCT Filed Oct. 23, 1981, Ser. No. 395,028

Claims priority, application Japan, Oct. 29, 1980, 55-151571

Int. Cl.⁴ G11B *5/012, 5/016, 5/82*

U.S. Cl. 360—98 **13 Claims**



1. An improved magnetic disk unit of the type wherein a plurality of magnetic disks are mounted at predetermined intervals on a magnetic recording disk mounting member which is mounted on a rotatable spindle, the magnetic recording disk mounting member having a ventilating hole which connects an area near said spindle and the spaces between magnetic recording disks so that air is circulated by the centrifugal force generated by rotation of said magnetic recording disks, wherein the improvement comprises: said magnetic recording disk mounting member has air ventilating holes which extend to the spaces between said magnetic recording disks from the upper and lower spindle portions of said magnetic recording disk mounting member to cause the air in the areas near said upper and lower spindle portions to be uniformly mixed and circulated into the spaces between said magnetic recording disks to equalize the temperature in the spaces between said magnetic recording disks and the temperature of the disks.

4,562,500

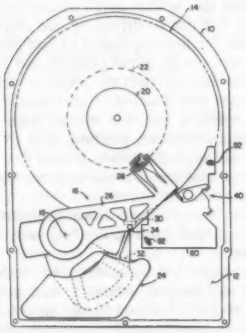
MECHANISM FOR LATCHING MAGNETIC DISK MEMORY HEAD/ARM ASSEMBLY IN PARKING ZONE

Perry A. Bygdnes, Redwood City, Calif., assignor to Tandon Corporation, Chatsworth, Calif.

Filed May 25, 1983, Ser. No. 497,873

Int. Cl.⁴ G11B *5/54, 17/00*

U.S. Cl. 360—105 **3 Claims**



1. A magnetic disk memory comprising:

a housing enclosing a plurality of spaced magnetic disks mounted on a spindle for rotation about the axis thereof, the housing having a base, the faces of the magnetic disks including data storage portions and a parking zone;

a head/arm assembly pivotally mounted on the base, the assembly including a plurality of arms carrying read/write heads operatively associated with the faces of the disks, a stop on the base being adapted to be engaged by the assembly when the heads are in the parking zone;

an actuator coupled to pivot the head/arm assembly to position the heads generally radially relative to the faces of the disks; and

a mechanism for latching the head/arm assembly in a parking zone position, the latching mechanism including:

a spring pawl projecting from the head/arm assembly in cantilever fashion, the spring pawl having an outer tip;

a latch plate pivotally mounted on the housing base, the plate having a first end and a second end opposite the first, the first end defining a step for receiving the spring pawl when the head/arm assembly is latched in the parking zone, the step including a small abutment surface adapted to be engaged by the tip of the spring pawl; and

a second stop projecting from the base, the second end of the latch plate being resiliently biased into engagement with the second stop and resisting movement of the head/arm assembly toward the unlatched position, unlatching of the head/arm assembly being effected by energizing the actuator to move the assembly away from the latched position, the pawl thereby pivoting the latch plate against the resilient bias, disengaging the pawl tip from the abutment surface.

4,562,501

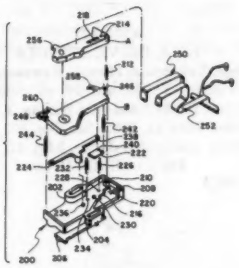
TRANSDUCER SUPPORT APPARATUS

Gill Cantwell, 2434 Purdue Ave., #17, Los Angeles, Calif. 90064

Filed Sep. 30, 1982, Ser. No. 431,481

Int. Cl.⁴ G11B *21/24*

U.S. Cl. 360—109 **26 Claims**



1. Apparatus for supporting and aligning a pair of magnetic transducers in operative relationship on opposite sides of a pliant rotatable magnetic disc comprising:

(A) a first transducer support arm;

(B) a second transducer support arm;

(C) a carriage means for carrying said first and second support arms;

(D) means biasing said first and second arms toward each other and toward said carriage means

(E) means carried by said carriage means for adjusting the position of one of said support arms relative the other to align said transducers by moving one transducer along a radial line relative to said magnetic disc and along a line transverse to said radial line and parallel to said disc; and

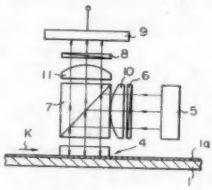
(F) said first transducer support arm and said second transducer support arm being on opposite sides of said magnetic disc.

4,562,502

OPTICAL REPRODUCING SYSTEM

Joichiro Ezaki; Hiroshi Kanai, and Yoshimi Kitahara, all of Nagano, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Apr. 20, 1983, Ser. No. 486,681
Claims priority, application Japan, Apr. 28, 1982, 57-72209; Apr. 28, 1982, 57-72210
Int. Cl.[4] G11B 5/32, 7/02
U.S. Cl. 360—114 10 Claims



1. An optical reproducing system for reading out magnetically stored information comprising;

(a) an optical head for obtaining magnetic copy in a magnetic pattern of data magnetically recorded on an area of a recording medium which contacts said optical head and moves relative to said optical head,

(b) conversion means for converting said magnetic pattern to an optical pattern,

(c) a reception means for receiving said optical pattern to convert said optical pattern to an electrical signal,

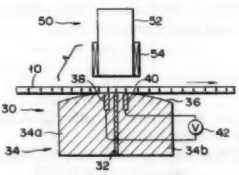
(d) said reception means converting said optical pattern with a plurality of data to said electrical signal simultaneously.

4,562,503

PERPENDICULAR MAGNETIC RECORDING HEAD

Yoshiharu Fujioka, Yamato; Akio Onuki, Ichikawa, and Shushi Takei, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 20, 1983, Ser. No. 515,550
Claims priority, application Japan, Jul. 30, 1982, 57-133549
Int. Cl.[4] G11B 5/20, 5/22
U.S. Cl. 360—123 12 Claims



1. A perpendicular magnetic recording head for recording a signal onto a recording medium comprising:

a main magnetic pole means having a magnetic pole film formed of magnetic material and having the main magnetic pole means permeability varied when an electric field is applied thereto, and an electrode means being able to form an electric field in the magnetic pole film corresponding to a signal; and

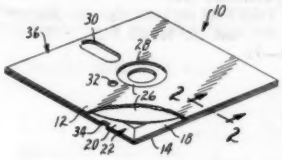
an auxiliary magnetic pole means disposed such that it opposes the main magnetic pole means with the recording medium interposed therebetween and having the capability of forming a magnetic field between the auxiliary magnetic pole means and the magnetic pole film.

4,562,504

MAGNETIC DISK JACKET AND FORMING PROCESS

Richard L. Miklos, Afton, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 24, 1982, Ser. No. 422,603
Int. Cl.[4] G11B 23/02
U.S. Cl. 360—133 4 Claims



1. A method for forming a disk jacket assembly for a magnetic disk from a precut sheet or material having areas defined as a top panel, a bottom panel and a plurality of edge flaps extending from said bottom panel, comprising the steps of:

applying an adhesive around the perimeter of one major surface of said sheet, leaving a central area in the shape of said disk on said top and bottom panels free of adhesive;

folding said flaps to overlie said bottom panel to form a circumferential spacer adhesively secured to said bottom panel and surrounding said central area to define a central, generally cylindrical, cavity;

inserting a said disk into said cavity and onto said bottom panel central area;

folding said top panel to overlie and be adhesively secured to said spacer so that said disk is contained within said cavity and rotatable between said top and bottom panels; and

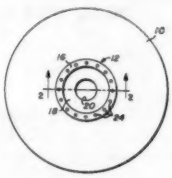
trimming said assembly to finished dimensions by removing material from each of the three edges formed by folding said flaps over said bottom panel so that said bottom panel remains attached to said flaps only through said adhesive.

4,562,505

FLEXIBLE MAGNETIC MEMORY DISK WITH METALLIC HUB AND METHOD OF MANUFACTURING SAME

Edward Mroz, Menlo Park, Calif., assignor to Verbatim Corporation, Sunnyvale, Calif.

Filed Dec. 20, 1982, Ser. No. 451,104
Int. Cl.[4] G11B 5/82
U.S. Cl. 360—135 10 Claims



1. In a magnetic memory disk having a plastic disk with a magnetic recording medium on at least one side thereof and a central aperture, a metallic hub for reinforcing the plastic disk adjacent the central aperture, said hub including:

an annular flange that abuts one side of the disk adjacent the central aperture;

a boss that projects axially from the annular flange through the central aperture;

a retainer ring that fits about the boss and abuts the side of the disk opposite from the annular flange; and

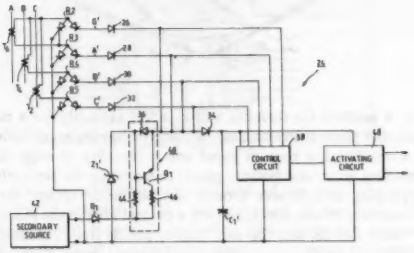
the improvement comprising a plurality of laser welds ex-

tending between the annular flange and the retainer ring that are spaced apart by the disk.

4,562,506
DISTRIBUTION LINE POWERED SWITCHGEAR CONTROL

Richard J. Moran, Milwaukee, Wis., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Feb. 14, 1984, Ser. No. 580,029
Int. Cl.[4] H02H *7/22, 3/07*
U.S. Cl. 361—71 **11 Claims**



1. A distribution line powered switchgear control comprising:

a direct current source;

an activating circuit for operating the switchgear mechanism to open and close the distribution line switches;

a control circuit for controlling said activating circuit;

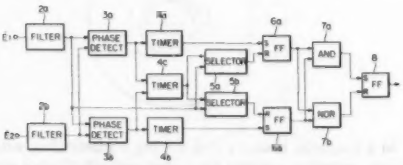
a power capacitor for rapidly providing power to said activating circuit while maintaining the appropriate power levels throughout the switchgear control; and

a fast arming circuit connected to said direct current source to rapidly charge said power capacitor through a low resistance path until said power capacitor is charged to an appropriate energy level whereupon the fast arming circuit ceases conducting.

4,562,507
PROTECTIVE RELAY

Hiroyuki Kudo; Atsumi Watanabe, and Hiroshi Sasaki, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 23, 1984, Ser. No. 573,137
Claims priority, application Japan, Jan. 24, 1983, 58-10213
Int. Cl.[4] H02H *3/26*
U.S. Cl. 361—85 **10 Claims**

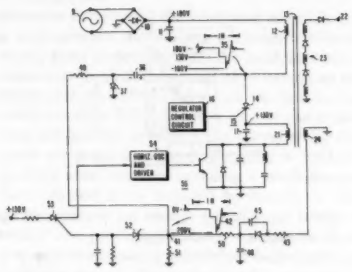


1. A protective relay comprising two first circuits generating two different square signals indicative of the phase difference between at least two sinusoidal inputs signals, two second circuits generating two square signals depending on the period of presence or absence of said first-mentioned two square signals respectively, and a third circuit including logical circuits for generating a single output representing the logical product or sum of said second-mentioned two square signals.

4,562,508
REGULATOR FAULT PROTECTION CIRCUIT

John Chen, Taichung; Chin Huang, Taoyuan, both of Taiwan; Nancy D. Graves, Indianapolis, and James E. Hicks, New Palestine, both of Ind., assignors to RCA Corporation, Princeton, N.J.

Filed May 10, 1984, Ser. No. 609,414
Int. Cl.[4] H02H *3/20*
U.S. Cl. 361—91 **2 Claims**



1. A protection circuit for a video display apparatus, comprising:

a source of unregulated voltage;

switching regulator means incorporating an SCR coupled to said source of unregulated voltage for producing a regulated voltage level, said SCR subject to failure by becoming shorted;

transformer means producing a control signal applied to said SCR for controlling an aspect of the operation of said SCR, said control signal having a particular characteristic, said shorting of said SCR causing said characteristic to be absent;

video display apparatus shutdown means responsive to a sensing signal for causing said video display apparatus to become inoperative when said sensing signal exceeds a predetermined level, said shutdown means coupled to said SCR and responsive to the presence of said characteristic of said control signal for providing a first control voltage signal for maintaining normal operation of said video display apparatus when said sensing signal is below said predetermined level, said shutdown means responsive to the absence of said characteristic for providing a second control voltage signal for causing said video display apparatus to become inoperative even when said sensing signal is below said predetermined level.

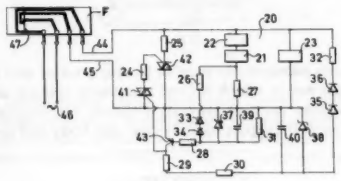
4,562,509
SAFETY SWITCH

Bengt Lindgren, Sollentuna, Sweden, assignor to Termofrost Sweden AB, Spanga, Sweden

Filed Mar. 5, 1984, Ser. No. 586,127
Int. Cl.[4] H02H *3/16*
U.S. Cl. 361—104 **1 Claim**

1. A safety switch, for a glass door, comprising a current scanning device connected to the conductors of an alternating voltage source, said glass door, being used for refrigerating and deep freeze chambers and comprising two or more glass panes of hardened glass, of which the front pane remote from the refrigerating and deep freeze chamber is heated by an electrically conductive layer attached on the inner surface of the pane, which layer is connected to an upper and, respectively, lower collecting conductor, and the rear pane facing to the refrigerating and deep freeze chamber is provided with at least one conductor attached on the pane, all of said which conductors being connected to said current scanning device, which is capable to scan whether current flows through said collecting

conductors and the conductors of the rear pane and is capable to break the the connection between the conductors of the two panes and the alternating current voltage source in the event that no current flows in the collecting conductors and/or in the conductor of the rear pane, characterized in that the current scanning device (20) comprises a fuse (F) of porcelain, on which bi-polar conductors from the voltage source are located, that the current scanning device (20) is capable to increase the current intensity through said fuse (F) in the event that current does not flow in the collecting conductors (12, 13) and/or in



the conductor (17) of the rear pane (4), and said porcelain fuse (F) thereby is heated so as to crack, whereby the bi-polar conductors on the fuse are broken, in a bi-polar manner so that on the fuse of porcelain where the bi-polar conductors connected to the voltage source (46) are located, the bi-polar conductors have a spacing distance between each other at the break point (47) of the fuse sufficient for a complete non-conductive break of each of the alternating voltage bi-polar conductors, which for a 220 Volt A.C. source should be at least 3 mm.

4,562,510

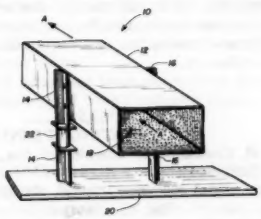
MATERIAL REPULSION BY ELECTROSTATIC CHARGE

John S. Forry, Manor Township, Lancaster County, and John R. Garrick, Lancaster, both of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Jun. 29, 1984, Ser. No. 626,323

Int. Cl.⁴ H05F *1/00*

U.S. Cl. 361—212 **8 Claims**



1. A method of reducing the accumulation of a specific material on a surface due to the effects of electrostatic charge comprising:

selecting materials of construction for a surface so that the surface will develop the same polarity of electrostatic charge as does the specific material, the accumulation of which is undesirable;

constructing a surface from the selected materials; and

electrically isolating the surface so that electrostatic charge developed on it will not be conducted away.

4,562,511

ELECTRIC DOUBLE LAYER CAPACITOR

Atsushi Nishino, Neyagawa; Akihiko Yoshida, Osaka, and Ichiroh Tanahashi, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

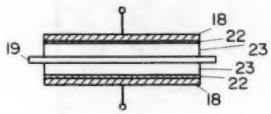
PCT No. PCT/JP83/00208, § 371 Date Feb. 28, 1984, § 102(e) Date Feb. 28, 1984, PCT Pub. No. WO84/00246, PCT Pub. Date Jan. 19, 1984

PCT Filed Jun. 30, 1983, Ser. No. 584,608

Claims priority, application Japan, Jun. 30, 1982, 57-114590; Sep. 14, 1982, 57-159849; Oct. 8, 1982, 57-177938; Jan. 28, 1983, 58-13456

Int. Cl.⁴ H01G *4/16, 4/22*

U.S. Cl. 361—324 **22 Claims**



1. An electric double layer capacitor having an electric double layer formed at an interface between a polarizable electrode and an electrolyte, wherein said polarizable electrode consists of carbon fibers or activated carbon fibers, a conductive electrode formed on one face of said polarizable electrode and an opposing electrode disposed on the other side of said polarizable electrode with said electrolyte inbetween.

4,562,512

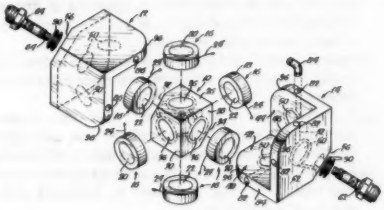
MULTIPLE SEMICONDUCTOR CONTAINING PACKAGE HAVING A HEAT SINK CORE

Thomas Sutrina, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 23, 1984, Ser. No. 633,647

Int. Cl.⁴ H05K *7/20*

U.S. Cl. 361—386 **13 Claims**



1. A semiconductor package comprising:

a heat sink core structure having the configuration of a geometric solid with a plurality of first faces defined by intersecting planes;

at least two heat sink caps, each having a generally concave surface provided by a plurality of second faces defined by intersecting planes, the total number of said second faces on said heat sink caps being equal to or less than the number of said first faces on said heat sink core structure, said caps being disposed about said core with said core nested in said concave surfaces,

corresponding ones of said faces on said core structure and said caps being generally parallel and defining semiconductor receiving spaces; and

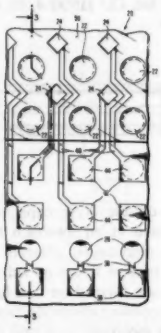
a plurality of semiconductors sandwiched between said caps and said core, one in each said semiconductor space.

4,562,513

PROCESS FOR FORMING A HIGH DENSITY METALLURGY SYSTEM ON A SUBSTRATE AND STRUCTURE THEREOF

Anthony F. Arnold, and Arnold F. Schmeckenbecher, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, New York, N.Y.

Division of Ser. No. 612,296, May 21, 1984, Pat. No. 4,521,449.
This application Mar. 4, 1985, Ser. No. 707,987
Int. Cl.[4] H05K *1/14*
U.S. Cl. 361—409 **1 Claim**



1. A high density multiple interconnection solder pad and fan-out metalurgy system for a multi-layer ceramic module comprising,

a multi-layer ceramic substrate having an internal metallurgy system,

a plurality of vias arranged in a closely spaced matrix, and an outer ring of vias surrounding said matrix in the top surface of said substrate,

a plurality of small indented areas arranged in a closely spaced matrix arranged within and with attending areas in the spaces between said matrix of vias, said matrix of vias and matrix of indented areas collectively defining an interconnection pad configuration,

a plurality of indented lines in said surface of said substrate, each of said indented lines terminating at one end at an indented area of said matrix, and at the opposite end at one of said vias in said outer ring of vias,

conductive metal material disposed in said indented lines and in said indented areas forming a surface metallurgy fan-out pattern,

a dielectric layer of material provided with openings over each of said vias in said matrix of vias, and each of said metal filled indented areas in said matrix of indented areas,

and a plurality of solder pads, each pad located over a via of said matrix of vias, and over an indented area of said matrix of indented areas.

4,562,514

POLARIZED ELECTRONIC COMPONENT AND ITS MANUFACTURING PROCESS

José V. Sansa, Barcelona, Spain, assignor to Componentes Electronicos SA-C.S.A., Barcelona, Spain

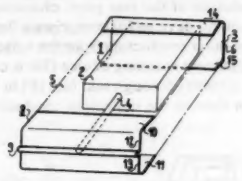
Filed Mar. 12, 1984, Ser. No. 588,708
Claims priority, application France, Mar. 18, 1983, 83 04482
Int. Cl.[4] H01G *9/00*; H01L *7/02*; B65D *73/02*
U.S. Cl. 361—433 **14 Claims**

1. A chip type polarized electronic component comprising:

a body, including a cathode contact and an anode contact;

a first metallic caliper connected to said cathode contact having a first face extended by two arms substantially perpendicular to said first face to form a generally "U"-shaped channel;

a second metallic caliper, disposed opposite said first metallic caliper, said second caliper having a second face, extended by two lateral arms substantially perpendicular to said second face, said second face having a fold which



extends substantially parallel to said arms of said second caliper and in which is fixed said anode contact; and

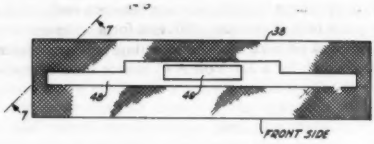
an insulating packing material, disposed between said first and second calipers so as to coat said body and contacts.

4,562,515

CALIBRATED AREA SOURCE TASK LIGHT

Terry L. Lautzenheiser, Tupelo, Miss., assignor to Emerson Electric Co., St. Louis, Mo.

Filed May 23, 1984, Ser. No. 612,975
Int. Cl.[4] F21V *13/00*; F21S *3/00*
U.S. Cl. 362—33 **6 Claims**



1. A task light for mounting on an underside of a shelf closely overhanging a work area which includes a work surface parallel with said shelf and a surface perpendicular thereto comprising; a flat, elongated, rectangular casing for mounting on the underside of said shelf, an elongated fluorescent bulb in said casing, a flat, rectangular prismatic lens in said casing having a surface facing said bulb, said lens surface having a continuous series of pyramids thereon providing inclined surfaces for dispersion of light over said work surfaces, and a smooth surfaced transparent sheet overlying said lens surface, said transparent sheet having at least two translucent areas each extending over a plurality of pyramids and having different dimensions, configurations and degrees of translucency thereby to variously diminish the intensity of certain light rays incident to said lens surface and thereby illuminate said work surfaces uniformly.

4,562,516

ILLUMINATING SPINNER

Edward H. Chastain, 668 Commercial Ave., South San Francisco, Calif. 94080

Filed Jan. 28, 1985, Ser. No. 695,469
Int. Cl.[4] B69Q *1/00*
U.S. Cl. 362—78 **16 Claims**

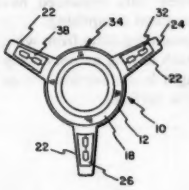
1. A generally circular illuminating spinner for automobile wheel comprising, in combination, a body member having

(a) a front opening therein, a closed rear wall and a side shoulder around the periphery of said front opening, a circular cap detachably affixed to top portion of said shoulder thereby forming a closure for said front opening, a cavity inside said spinner encircled by said shoulder, a plurality of wings exending outwardly from said shoulder, each of said wings including a front wall having an aperture therein and a closed rear wall;

(b) an adapter means secured to said rear wall of each said

wings for adjustably fastening said spinner to said wheel adjacent hub opening thereof; and

(c) electrical components forming circuitry disposed inside said spinner for providing illumination thereto comprising



a light-emitting diode positioned within each of said wings, a manually operable switch means mounted in said side shoulder, a source of electrical energy in said cavity, said components being electrically interconnected.

4,562,517

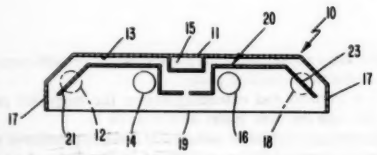
REFLECTOR SYSTEMS FOR LIGHTING FIXTURES AND METHOD OF INSTALLATION

Sidney M. Pankin, San Rafael, Calif., assignor to Maximum Technology, Brisbane, Calif.

Continuation-in-part of Ser. No. 470,091, Feb. 28, 1983, abandoned. This application Feb. 7, 1984, Ser. No. 577,837

Int. Cl.⁴ F21S *3/00*

U.S. Cl. 362—147 **8 Claims**



1. In a lighting fixture having an original lumen output including a base, original reflector means in said base and a plurality lamp means mounted on said base and connectable to a source of electricity, a method of improving the efficiency of said fixture and maintaining lumen output of said fixture at a high percentage of said original lumen output, comprising the steps of:

(a) removing some of said lamp means;

(b) installing further reflector means in substantially surrounding relation to the lamp means remaining in said fixture after said removing step without removing said original reflector means;

(c) isolating said remaining lamp means from said original reflector means by said further reflector means.

4,562,518

LIGHT ASSEMBLY FOR USE ON VEHICLES

Toji Kumagai, Hadano, Japan, assignor to Ichikoh Industries Limited, Tokyo and Yugen-Gaisha Shiba Seisakusho, Ebina, both of, Japan

Filed May 30, 1984, Ser. No. 615,464

Claims priority, application Japan, May 31, 1983, 58-94991

Int. Cl.⁴ F21V *21/00*

U.S. Cl. 362—249 **5 Claims**

1. A light assembly for use in vehicles, comprising:

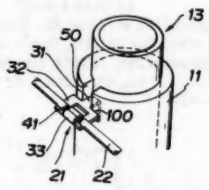
a housing having a back plate and an opening opposite the back plate;

a lens for covering the opening of the housing;

a plurality of electroconductive sockets for containing light bulbs;

a socket holder corresponding to each socket including insulating material, a wall portion for supporting the corresponding socket said wall portion having an inner wall disposed adjacent the socket, and a cut in a top end of the wall portion;

an earth wire made of a coated conductor having stripped portions disposed at intervals corresponding to a distance between the socket holder, and being electrically connected to ground;



a terminal corresponding to each socket holder having a plurality of first tongue portions for being crimped about the stripped portions of the earth wire and for establishing electrical contact between the terminal and the earth wire, and having an electrical contact section for being forcibly fit into the cut in the socket holder, for being tightly disposed between the inner wall and the socket, and for establishing electrical contact between the socket and the earth wire.

4,562,519

HEADLAMP FOR AN AUTOMOBILE

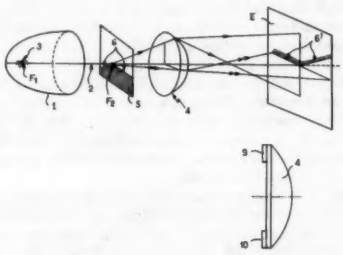
Patrick Deves, Saint Maur, France, assignor to Cibie Projecteurs, Bobigny, France

Filed Jul. 31, 1984, Ser. No. 636,321

Claims priority, application France, Aug. 18, 1983, 83 13442

Int. Cl.⁴ F21V *13/00*

U.S. Cl. 362—308 **10 Claims**



1. A headlamp for an automobile, capable of emitting a beam of light with a cut-off, said headlamp comprising: a part-ellipsoidal reflector having a substantially horizontal optical axis, a first focus on said axis relatively close to said reflector and a second focus on the axis relatively distant from said reflector; a light source located in the vicinity of said first focus of said reflector; a convergent lens arranged opposite said reflector with respect to said second focus of said reflector, said lens being arranged in a substantially vertical plane and having a substantially horizontal optical axis in common with that of said reflector and a focus in the vicinity of said second focus of said reflector; a substantially vertical masking screen with a generally horizontal cut-off edge arranged in the vicinity of said focus of said lens and having its said cut-off edge close to the common optical axis in order to define a substantially horizontally cut-off beam, and spaced apart localized deflector elements in the vicinity of said lens at its upper part and at its

lower part to produce a deflection of the light passing through said upper and lower parts of said lens in order to reduce the effects of chromatic aberrations in the vicinity of said cut-off, each of said deflector elements being substantially contiguous with the adjacent edge of the lens at its outer edge and having a substantially horizontal inner edge, said inner edges defining a deflector free lens area therebetween.

4,562,520

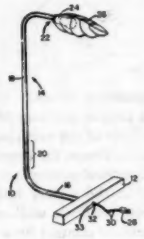
FLOOR LAMP

Earle F. Chapman, 481 W. Main St., Avon, Mass. 02322

Continuation of Ser. No. 261,675, May 7, 1981, abandoned. This application Jun. 1, 1984, Ser. No. 615,674

Int. Cl.⁴ F21S *1/12*

U.S. Cl. 362—414 **4 Claims**



1. A floor lamp comprising;

an elongated base; and

a U-shaped stanchion tube having an extended foot portion adapted to rest on the floor and secured at its end to substantially the center of an elongated side of said base at an angle normal thereto, an upright portion with a swivel formed therein, and a head portion extending at substantially a right angle to the upright portion and substantially parallel to said foot portion, said head portion having a lamp socket mounted at the end thereof;

wherein said tube is formed of two members, a first member including said foot portion and a second member including said head portion, which members each include part of said upright portion and are connected at said swivel in a manner to form a flush mounted joint;

wherein said first member includes a tubular section having the same outer diameter as said first member but having a smaller inner diameter and having a flat end surface the end of said tubular section opposite to said flat surface being flush mounted and secured to the upright portion end of said first member;

a sleeve having an inner diameter which is the same as the inner diameter of said tubular section flush mounted inside the upright portion of said second member at its end to reduce the inner diameter of said member, said upright portion end with said sleeve therein having a flat end surface; and

a tubular member dimensioned to fit and being snugly fitted in said tubular section and said sleeve and extending on both sides of said swivel;

said flat end surfaces of said tubular section and said second member abutting to form the swivel surfaces of said swivel.

4,562,521

LANTERN TYPE ELECTRIC LAMP

Isamu Noguchi, 333 E. 69th St., New York, N.Y. 10021

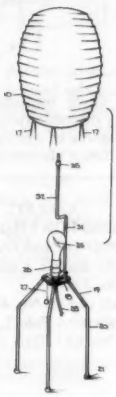
Filed Aug. 6, 1984, Ser. No. 638,022

Int. Cl.⁴ F21S *1/12*

U.S. Cl. 362—433 **9 Claims**

1. In combination with a collapsible oriental lantern, a lampstand supporting in a fully expanded state said collapsible oriental lantern which is formed by an open-ended translucent shell whose upper opening is bordered by atop rib and whose lower opening is bordered by a spiderless bottom rib which does not obstruct the lower opening, a spider having a central hub provided with a hole being attached by its radial arms to the top rib, leg connectors being attached to the bottom rib, said lantern when fully expanded having a predetermined length, said lampstand comprising:

(A) a raised mounting plate from which depends an array of like legs, each having an outwardly sloped upper section and a straight lower section whose foot is restable on a floor or table surface;



(B) a lamp socket and a harp associated therewith supported above the mounting plate;

(C) a vertical rod extending above the harp and passing through the hole in the hub;

(D) means to hold said hub on said rod at a position at which the lantern is fully expanded and said spiderless bottom rib rests on said upper leg sections at a position determined by its length, whereby the same lampstand may be used for lanterns of different lengths, said position being maintained by attaching said bottom rib to the said upper leg sections with said leg connectors.

4,562,522

POWER SUPPLY FOR AN ELECTROSTATIC AIR CLEANER WITH A MODULATED PULSE WIDTH VOLTAGE INPUT HAVING A BACKUP PULSE WIDTH LIMITING MEANS

John T. Adams, Minneapolis, and Arlon D. Kompelien, Richfield, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 30, 1983, Ser. No. 567,432

Int. Cl.⁴ B03C *3/66*

U.S. Cl. 363—21 **4 Claims**

1. In a power supply for an electrostatic air cleaner load comprising:

a fly-back transformer having a bifilar input winding and two secondary windings, a first of said secondary windings being adapted to be connected across the collector cell and a second of said secondary windings being adapted to be connected across the ionizer unit,

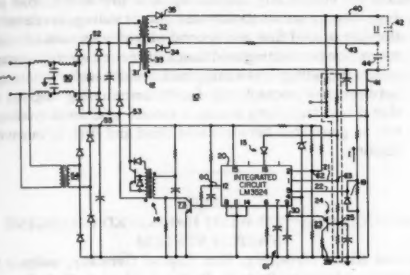
oscillator circuit means having a high frequency sawtooth output signal,

normal error circuit means having an error output signal proportional to current and voltage outputs of said secondary windings,

circuit means recciving said sawtooth output signal and said error output signal to produce a high frequency pulsing

control signal having pulse lengths increasing with the magnitude of said error output signal,

means connecting said pulsing control signal to said bifilar windings of said transformer, and



backup responsive circuit means responsive to said error signal or an undervoltage signal of said secondary winding for maintaining said pulse lengths below a maximum value to limit the output current of said transformer or for reducing the output current.

4,562,523

POWER SUPPLY

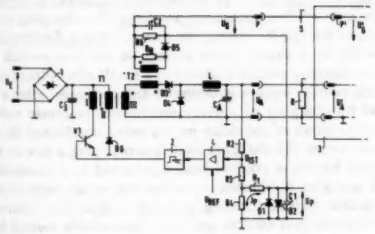
Gerhard Rödel, Igensdorf, and Werner Wölfel, Stuttgart, both of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jan. 31, 1984, Ser. No. 575,437

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1983, 3303782

Int. Cl.⁴ H02M *3/335*

U.S. Cl. 363—21 **4 Claims**



1. Power supply consisting of at least two parallel switching-supply modules each containing a current sensor having a first terminal which is connected by a connection to an error amplifier forming part of an output-voltage-regulating circuit acting on a pulse-width modulator, and a second terminal which is connected to the corresponding second terminal of the current sensor of the respective other of the at least two switching-supply modules, characterized in that the connection of the second terminal to the error amplifier (4) incorporates a limiter (D_1, D_2; 5).

4,562,524

CONTROL APPARATUS FOR PWM INVERTER

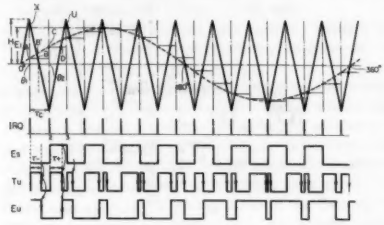
Nobuyoshi Mutoh; Keijiro Sakai, both of Hitachi; Motonobu Hattori, Funabashi, and Yuichiro Nagato, Chiba, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 25, 1984, Ser. No. 664,773

Claims priority, application Japan, Oct. 28, 1983, 58-200808

Int. Cl.⁴ H02M *7/217*

U.S. Cl. 363—41 **5 Claims**



1. A control apparatus for generating a pulse width modulation signal to be used for operating a pulse width modulation inverter, comprising:

means for generating a rectangular signal which assumes alternately high level and low level at every selected periodical time interval;

means for sampling at every periodical time interval a modulating wave whose level varies in the form of a sinusoidal waveform of a frequency and an amplitude determined, respectively, by a given frequency command and a given voltage command to thereby determine the levels of said modulating wave at each of the sampling time points;

means for determining time interval between said sampling time point and a point of a virtual triangular wave which has positive and negative peaks of a predetermined value alternating at every periodical time interval, said point being positioned on a segment of said virtual triangular wave extending between the peak of said virtual triangular wave corresponding to said sampling time and the succeeding peak of the opposite polarity at a same level as that of said modulating waveform at said sampling time point; and

means for generating the pulse width modulation signal on the basis of said time interval and the level of said rectangular signal at a time point which corresponds to time lapse of said time interval from said sampling point for which said time interval has been determined.

4,562,525

DC POWER SUPPLY CIRCUIT FOR LINE INTERFACE CIRCUITS

Michel F. M. S. Ferry, Vallauris, and Jacques L. Trehin, Nice, both of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 9, 1984, Ser. No. 629,286

Claims priority, application European Pat. Off., Jul. 11, 1983, 83430021.2

Int. Cl.⁴ H02M *1/14*; H04M *1/74*

U.S. Cl. 363—45 **8 Claims**

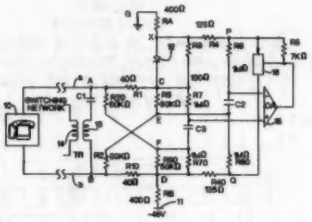
1. A DC supply circuit comprising a first and a second output terminals (A and B) connected to the device to which current is to be fed, a DC voltage source including a first (G) and a second (11) terminals, a first resistor (RA) a first end of which is connected to said first terminal (G) of said DC voltage source and the second end (X) of which is connected to said first one (A) of said output terminals, and a second resistor (RB) a first end of which is connected to said second terminal (11) of said DC voltage source, and the second end of which is connected to said second one (B) of said output terminals, characterized in that it includes:

a secondary DC path (R4, 16, R40) connected between said

second ends of said first and second resistors, and in which a current generator (16) is inserted,

means (12, 15, R4, 16) for maintaining the direct current (Ic) flowing in said secondary path at a constant value,

detection means (R1, R10, R2, R20, R3, R30) for measuring the alternating current flowing between said output terminals and in the device to be supplied with direct current, and



control means (C2, C3, 15) connected to said detection means for controlling said current generator to cause a negative-feedback alternating current to flow in said secondary path, and for adjusting the value of the latter current so as to cancel said alternating current flowing between said output terminals.

4,562,526

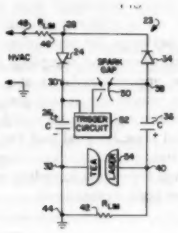
VOLTAGE CONTROL CIRCUIT

Robert J. Matthys, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 394,227, Jul. 1, 1982, abandoned. This application Nov. 14, 1984, Ser. No. 671,795

Int. Cl.⁴ H02M *7/19*

U.S. Cl. 363—61 **32 Claims**



1. A voltage control circuit for impressing an output voltage upon a gas discharge device, wherein said circuit includes a reference point, comprising:

first energy storage means adapted to store electrical energy in response to a potential source of a first polarity relative to said reference point, thereby providing a voltage of a first magnitude, wherein said first energy storage means includes a first unidirectional current conducting means adapted to pass substantial current from a first terminating region to a second terminating region, and a first capacitor means electrically connected to and between said second terminating region and a third terminating region, wherein said third terminating region is directly electrically connected to said device;

second energy storage means adapted to store electrical energy in response to a potential source of a second polarity relative to said reference point, thereby providing a second voltage of a second magnitude, wherein said second energy storage means includes a second unidirectional current conducting means electrically connected to said first terminating region and adapted to pass substantial current from a fourth terminating region to said first terminating region, and a second capacitor means electrically connected to and between said fourth terminating region and a fifth terminating region, and wherein said fifth terminating region is directly electrically connected to said device; and

means for electrically connecting said first and second energy storage means so that said output voltage is related to the sum of said first and second magnitudes, wherein said means for connecting said first and second energy storage means including a switching means electrically connected between said second and fourth terminating regions so that if said switching means is closed, said output voltage can be generated between said third and fifth terminating regions.

4,562,527

AUTOCONVERTER WITH IMPROVED CHARGING SWITCH SYSTEM

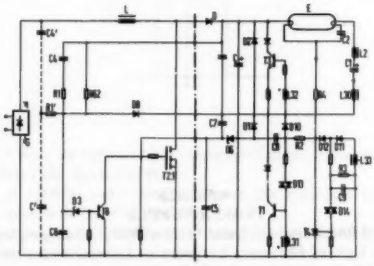
Manfred Klamt, Trostberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 11, 1984, Ser. No. 570,003

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1983, 3301632

Int. Cl.⁴ H02M *7/04*

U.S. Cl. 363—89 **5 Claims**



1. An autoconverter, comprising: a charging capacitor connected to a d.c. source via a charging diode and a charging inductor; a charging switch periodically closed by a signal from a control means with a given pulse-duty factor; the charging switch periodically connecting the charging inductor to the d.c. source; two series connected alternately driven first and second switches connected parallel to the charging capacitor; means for synchronizing the control means for the charging switch by a square wave voltage at the first switch such that the charging switch is closed as a result of a voltage across said first switch when it is inhibited and is opened after a time defined by charging of a delay means to a response valve; a discharge circuit of the delay means being conducted through the first switch; the charging switch comprising a power MOS transistor having a control lead connected to a controllable switch and also to a series capacitor; the series capacitor and controllable switch forming a series connection connected parallel to the first switch; and said controllable switch being driven into a closed position via a threshold element means as a function of a voltage at said delay means.

4,562,528

BACKUP CONTROL APPARATUS

Akinori Baba, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 6, 1982, Ser. No. 433,152

Int. Cl.⁴ G06F *15/46*

U.S. Cl. 364—133 **4 Claims**

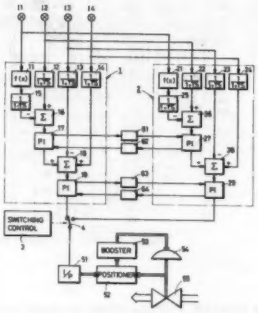
4. A backup control apparatus, comprising:

a main control system,

a backup control system provided in parallel with said main control system,

switch means responsive to one of said main control system and said backup control system being in an abnormal state for being turned to the other of said main control system and said backup control system,

means responsive to said one of said main control system and said backup control system being in an abnormal state for providing a tracking signal to the other of said main control system and said backup control system during a time period when a switching operation is performed by said switch means,



a machine to be controlled alternatively by said main and backup control systems in response to said tracking signal;

a path for said tracking signal provided between said main control system and said backup control system, and

signal smoothing means provided in said tracking signal path for continuously smoothing fluctuations of said tracking signal provided to said other of said main control system and said backup control system during said switching operation to minimize the effect of the abnormal state on said other of said main control system and said backup control system following said switching operation.

4,562,529

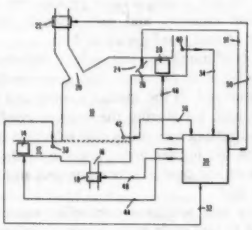
CONTROL OF REAL TIME INDUSTRIAL PROCESSES

Andrew F. Drummond, Wimborne, England, assignor to Programasyst Limited, Bournemouth, United Kingdom

Continuation-in-part of Ser. No. 417,120, Sep. 1, 1982, abandoned. This application Oct. 31, 1984, Ser. No. 666,766

Int. Cl.⁴ G06F *15/46*

U.S. Cl. 364—140 **21 Claims**



1. A method of, controlling an industrial process for which a multiplicity of "operating states" of the process are separately identifiable, each said operating state being a combination of all the control conditions instantaneously prevailing throughout the process, which method comprises the steps of:

(a) representing each one of said multiplicity of said operating states in a control apparatus (**30**) by a corresponding logical variable of a "set" of such variables, in which set the multiplicity of members of the set is equal to at least the said multiplicity of said operating states;

(b) causing the variables of said set to comply in said apparatus with the rules that:

(i) one, and only one, member of the set can have the value TRUE at any one time, all others inherently then having the value FALSE;

(ii) any other member of said set can be required for control of the controlled process be the next succeeding member to take the value TRUE; and

(iii) no member of said set may take the value FALSE except as a consequence of another member of the set taking the value TRUE;

(c) maintaining a correspondence between said separately identifiable operating states of the process and the logical values of the corresponding members of said set in said control apparatus (**30**) by detecting from feed back data or otherwise the occurrence of the required conditions appertaining to the change of operating state of the process from one current, operating state to another operating state and accordingly causing the said variable representing the said another operating state to take the value TRUE, the variable representing said one operating state thereupon automatically reverting to the value FALSE; and

(d) initiating in said control apparatus any necessary and relevant control action consequent upon the setting to the value TRUE of said logical variable representing said another operating state; and in which method representation of the operation of said process in said control apparatus (**30**) progresses from the member of said set which is currently TRUE directly to any other member of the set as appropriate upon detecting the occurrence of the required conditions appertaining to the relevant change of operating state of the process.

4,562,530

ELEVATOR TRAFFIC DEMAND ANALYZING SYSTEM

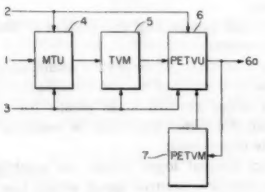
Yasukazu Umeda, Kasugai, and Kenichi Uetani, Nishi, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 4, 1983, Ser. No. 481,940

Claims priority, application Japan, Apr. 6, 1982, 57-56867

Int. Cl.⁴ G05B *13/02;* **B66B** *1/00, 3/00*

U.S. Cl. 364—148 **10 Claims**



1. A system for controlling a plurality of elevator cars according to a varying traffic demand wherein the traffic demand is divided into a plurality of time cycles which, in turn, are further divided into a plurality of corresponding time periods, said system comprising:

means for generating in each cycle a value indicative of the measured traffic demand in at least one period in the cycle, the periods for which the measured values are generated corresponding from one cycle to another;

first storage means for storing in each cycle the measured values for a predetermined number of preceding corresponding periods;

means for generating in each cycle a value indicative of an estimated traffic demand for a corresponding period subsequent to the preceding corresponding period in accor-

dance with the measured values in said first storage means; and

means for selectively controlling at least one elevator car in accordance with the estimated value.

4,562,531

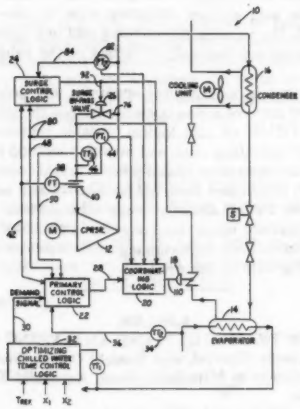
INTEGRATED CONTROL OF OUTPUT AND SURGE FOR A DYNAMIC COMPRESSOR CONTROL SYSTEM

Larry L. Enterline, Waite Hill, and Azmi Kaya, Akron, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Oct. 7, 1983, Ser. No. 539,774

Int. Cl.⁴ F25D *17/00*; F25B *49/00*

U.S. Cl. 364—164 **9 Claims**



1. A chilled water system having a centrifugal compressor and an integrated control system for simultaneously controlling both the load output and surge protection of the compressor comprising:

valve means for controlling the amount of fluid drawn by the compressor;

compressor control logic means for establishing a first control signal indicative of desired compressor load output;

compressor surge control logic means for establishing a second control signal indicative of required flow bypass across the compressor;

coordinating control logic means for establishing a bias signal to said first control signal which bias signal is related to said second control signal to control said valve means in response to said biased first control signal; and

said compressor control logic means including:

means for establishing a compressor main control signal of optimum chilled water demand from the chilled water system;

means for establishing a feed forward control signal indicative of the actual output temperature of the output of the chilled water system combined with the output of said compressor main control signal into a first combined control signal; and

means for establishing a cascade control signal indicative of the mass flow through the compressor combined with said combined control signal from said feed forward means to thereby form said first control signal.

4,562,532

MAIN STORAGE CONFIGURATION CONTROL SYSTEM

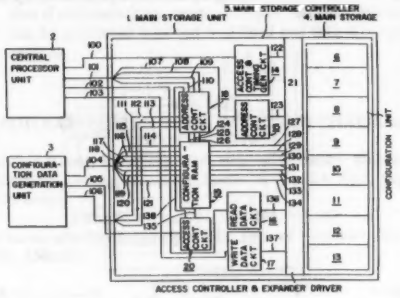
Hiroshi Nishizawa, Kawasaki; Saburo Ando, Tokyo, and Syuji Ito, Seki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation-in-part of Ser. No. 101,690, Dec. 10, 1979, abandoned. This application May 24, 1982, Ser. No. 381,554

Claims priority, application Japan, Dec. 13, 1978, 53-154827

Int. Cl.⁴ G06F *13/00*

U.S. Cl. 364—200 **3 Claims**



1. A main storage configuration control system for a data processing system having a central processor unit for providing a main storage address for a main storage unit comprising a main storage, including a plurality of memory units each having a memory address register, and a main storage controller for selecting one of the plurality of memory units and for controlling reading and writing of information with respect to the selected memory unit, said main storage address having higher and lower order portions, the lower order portion being used for addressing memory locations within each selected memory unit, the main storage configuration control system comprising:

configuration data generation means for generating plural units of configuration data, including:

a configuration processing unit for generating the units of configuration data;

a configuration memory, operatively connected to said configuration processing unit, for storing the configuration data;

a console, operatively connected to said configuration processing unit and said configuration memory, for initiating generation of the configuration data; and

a main storage unit interface controller, operatively connected to said configuration processing unit, said configuration memory and said console, for controlling transfer of said configuration data;

reloadable configuration unit select information storage means, included in the main storage controller and operatively connected to the memory units and to the central processor unit, for storing the units of configuration data and for outputting a memory unit selection signal in accordance with the higher order portion of the main storage address from the central processor unit and the configuration data; and

configuration unit selection controller means, operatively connected to said main storage unit interface controller of said configuration data generation means, the central processor unit and said reloadable configuration unit select information storage means, for selectively controlling write-in of said configuration data from said configuration data generation means into said reloadable configuration unit select information storage means and for selectively controlling readout of one of the units of configuration data, as said memory unit selection signal, from said reloadable configuration unit select information storage

means in accordance with the higher order portion of the main storage address from the central processor unit, so that one of the plurality of memory units is selected by the higher order portion of the main storage address and accessed by the lower order portions of the main storage address.

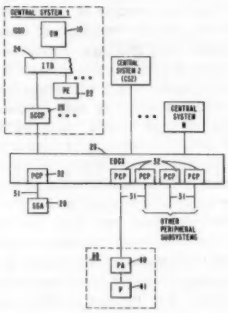
4,562,533
DATA COMMUNICATIONS SYSTEM TO SYSTEM ADAPTER

Alfred Hodel, Au, Switzerland; Dennis B. Merkes, and Venu Chari, both of San Diego, Calif., assignors to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 327,283, Dec. 3, 1981, abandoned. This application Aug. 20, 1984, Ser. No. 642,736

Int. Cl.[4] G06F *3/04*

U.S. Cl. 364—200 **5 Claims**



1. In a data processing system having a plurality of central systems, each of said central systems having

a central memory,

a processor and

at least one serial channel control processor (SCCP), said data processing system further having an adapter for providing for the exchange of data between two of said central systems, said adapter acting as a peripheral of one central system and then as a pheripheral of the other central system, the method of exchanging data between two of said central systems comprising the steps of:

a. executing first I/O instructions from the processor of a first central system when the first central system desires to receive data from a second central system;

b. responsive to said first I/O instructions, establishing by said processor of the first central system in the central memory of said first central system, a first I/O field which includes a check field and a first starting address for storing the data to be received;

c. after establishing the I/O field in the first central memory, issuing first instructions by the first central system processor to the SCCP of said first central system to engage in a first command message sequence with said adapter, said first command message sequence for establishing communications with a second central system, and containing said check field and the address of said first I/O field;

d. transmitting said first command message sequence including said check field and said address of said first I/O field between the SCCP of the first central system and said adapter;

e. responsive to said first command message sequence, said adapter storing said check field and said address of said first I/O field;

f. when data is to be transferred from said second to said first central systems, executing second I/O instructions from the processor of said second central system;

g. responsive to said second I/O instructions, establishing by said processor of said second central system in the central memory of said second central system, a second I/O field which includes said check field and a second starting address in said second central memory for locating the data to be transferred;

h. after establishing the second I/O field in the second central memory, issuing instructions by the second central system processor to the SCCP of said second central system to engage in a second command message sequence with said adapter, said second command message sequence for completing communication with said first central system, and containing said check field and the address of said second I/O field;

i. transmitting said second command message sequence including said check field and said address of said second I/O field between the SCCP of the second central system and said adapter;

j. responsive to said second command message sequence, said adapter storing said check field and said address of said second I/O field;

k. issuing a first service needed message from said adapter to said second central system;

l. responsive to said first service needed message, verifying by the SCCP of said second central system that the check field stored in said adapter is the same as the check field included in said second I/O field from the second I/O field address in the memory of said second central system;

m. responsive to positive verification in step **1**, transmitting by the SCCP of said second central system, data from the central memory of said second central system to said adapter;

n. subsequent to the successful completion of step m, issuing a second service needed message from said adapter to said first central system;

o. responsive to said second service needed message, verifying by the SCCP of said first central system that the check field stored in said adapter is the same as the check field included in said first I/O field from the first I/O field address in the memory of said first central system; and

p. responsive to positive verification in step o, transmitting the data received by said adapter in step m from said adapter to the central memory of said first central system.

4,562,534
DATA PROCESSING SYSTEM HAVING A CONTROL DEVICE FOR CONTROLLING AN INTERMEDIATE MEMORY DURING A BULK DATA TRANSPORT BETWEEN A SOURCE DEVICE AND A DESTINATION DEVICE

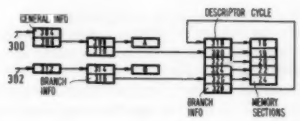
Frederik Zandveld; Daniël Schouten, and Peter C. L. van der Vliet, all of Beekbergen, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 407,194, Aug. 11, 1982, abandoned. This application Apr. 3, 1985, Ser. No. 720,041

Claims priority, application Netherlands, Aug. 21, 1981, 8103895

Int. Cl.[4] G06F *3/04, 13/00*

U.S. Cl. 364—200 **2 Claims**



1. A data processing system having a control device for controlling a bulk data transport from a source device (**10**) to a destination device (**28**) via an intermediate memory (**14**), wherein the intermediate memory comprises a plurality of cyclically linked memory sections assigned to the transport as representing a buffer of quasi-infinite-length, wherein the control device comprises a descriptor device having a plurality of

first descriptors (318–326) and at least one second descriptor (328), a set of first and second descriptors being connected in a chain having a single loop, each first descriptor containing:

a data chaining bit signalling that the descriptor is part of said chain;

a memory address;

a non-branch bit signalling that the memory address indicates an associated linked memory section, and signalling that the next descriptor is located in the next location of the descriptor device;

an availability bit which in a first state signals availability exclusively to the source device and in a second state signals availability exclusively to the destination device;

a synchronization bit which has a first state to validate the condition signalled by the availability bit;

a stop bit including an alarm condition;

and a termination bit (LST-IND) which in a first state allows continued accessing of the descriptor device by any of said source and destination devices, but in a second state denies continued accessing of the descriptor device to at least a first one of said source and destination devices;

each second descriptor containing:

a data chaining bit;

a memory address;

a branch bit signalling that the memory address indicates the next descriptor; said source and destination device having accessing means for accessing said descriptors and in case of a first descriptor an associated memory section, testing means for testing said availability bit, said stop bit and said termination bit, and setting means, after filling a memory section by the source device, for setting the associated availability bit to the second state and, after vacating a memory section by the destination device, for setting the associated bit the first state, and in that at least a second one of said source and destination devices has further setting means for setting said termination bit to its second state.

4,562,535

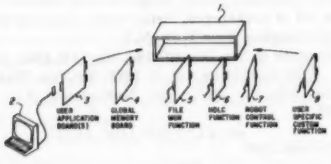
SELF-CONFIGURING DIGITAL PROCESSOR SYSTEM WITH GLOBAL SYSTEM

Geoffrey P. F. Vincent; Nicholas K. D. Ing-Simmons; John McGrath, all of Bedford, England, and Marvin C. Conrad, Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 5, 1982, Ser. No. 365,813

Int. Cl.[4] G06F *3/04, 15/16*

U.S. Cl. 364—200 **6 Claims**



1. A data processing system comprising:

an information bus for transferring data between a plurality of module slots, said plurality of module slots including one unique module slot;

a logical arbiter memory means connected for transfer of data to and from said information bus, for storing therein a global function table of function names together with their corresponding module number and having an initialization counter;

a plurality of function modules each connected to one of said module slots for transfer of data to and from said information bus, each function module having

(1) a bus priority means for determining a bus priority for control of data transfer via said information bus,

(2) function means to perform at least one computational function in response to a corresponding function request from said information bus, each such computational function having a corresponding one of said function names, and

(3) initialization means actuated upon each initial application of electric power to said function module, said initialization means including (a) means for determining whether said function module is connected to said unique module slot, (b) means for requesting information bus control immediately upon initialization if said function module is connected to said unique module slot and for waiting for a wake up signal from said function module connected to said unique module slot via said information bus and then requesting information bus control if said function module is not connected to said unique module slot, (c) means for initializing said global function table, setting said initialization counter to "1" and reading and storing said initialization counter state if said function module is connected to said unique module slot, and for reading and storing said initialization counter state and then incrementing said initialization counter if said function module is not connected to said unique module slot, (d) means for assigning one of said module numbers to said function module corresponding to said stored state of said initialization counter thereby making said function module responsive to function requests directed to said module number, (e) means for transferring to said logical arbiter memory means for storage in said global function table said function name and said corresponding module number for each computational function, (f) means for generating said wake up signal and for transmitting said wake up signal to other function modules via said information bus if said function module is connected to said unique module slot, and (g) means for executing a delay for a predetermined period of time upon storing said function name and said module number in said global function table said predetermined period being sufficient to permit initialization by said initialization means of all other function modules; and

a bus arbitration means connected to said bus priority means of each function module via said information bus for permitting one and only one function module to control data transfer via said information bus based upon said bus priority of any function module requesting control of said information bus.

4,562,536

DIRECTORY TEST ERROR MODE CONTROL APPARATUS

James W. Keeley, Hudson; Robert V. Ledoux, Litchfield, both of N.H., and Virendra S. Negi, Pepperell, Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jun. 30, 1983, Ser. No. 509,825

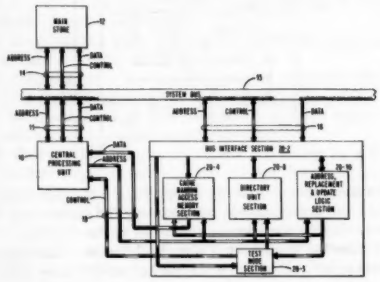
Int. Cl.[3] G06F *13/00*

U.S. Cl. 364—200 **32 Claims**

1. Test mode control apparatus for verifying the operation of a cache unit coupled to a processing unit during the execution of a directory test, said cache unit including cache and directory stores, each organized into the same number of levels of storage locations, each of said directory store locations for storing an address designating which one of said cache levels contains corresponding data, checking means coupled to said directory store for generating a number of address check bits to be stored with said address to detect any errors in said addresses accessed from said directory store during each of a number of different types of cache cycles of operation in response to requests from said processing unit, degradation mode control means coupled to said stores and to said checking means, said degradation mode control means being operative in response to errors detected by said checking means to automatically degrade the operation of said cache unit to those directory and cache store levels which are free from errors,

replacement circuit means coupled to said directory store and to said degradation mode control means for designating which one of said levels is the next level into which replacement data is to be written during a cache replacement cycle of operation and said test mode control apparatus being coupled to said checking means and to said processing unit, for receiving cache commands during said directory test coded to specify the type of operation to be performed by said test mode control apparatus, each command including a first field having a number of bits coded to specify a directory test mode of operation, said test mode control apparatus comprising:

directory mode control means coupled to receive said bits of said first field and to said checking means, said directory



mode control means when switched to a first state in response to said bits of said first field conditioning said cache unit for operating in said test mode of operation; and,

logic means coupled to said directory mode control means, to said error checking means, and to said replacement circuit means, said directory mode control means when said first state conditioning said logic means for causing said check means to selectively generate said number of address check bits which are bad only during predetermined ones of said different types of cache cycles of operation performed by said cache unit for verifying the operation of said checking means and said degradation mode control means.

4,562,537

HIGH SPEED PROCESSOR

Howard S. Barnett, Dallas; Michael J. Cochran, Richardson, and Sid Poland, Arlington, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 13, 1984, Ser. No. 599,911

Int. Cl.⁴ G06F *9/00*

U.S. Cl. 364—200 **2 Claims**

1. A system having a high speed processor for executing program sequence in a single fetch cycle and comprising:

(a) an instruction memory means for storing instructions to control the operation of the high speed processor;

(b) a data memory means for storing data to be operated on by the high speed processor;

(c) means for prefetching an instruction from the instruction memory means during operation of the high speed processor upon data from said data memory means, wherein the time between the prefetching of a first instruction and a second instruction is defined as a fetch cycle and the prefetching means includes means for decoding instructions that occur early in the fetch cycle, and means for decoding instructions that occur late the fetch cycle;

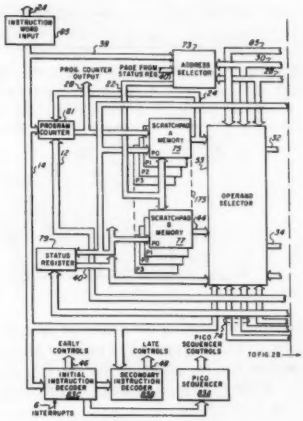
(d) an arithmetic and logic unit (ALU) connected to receive data and instructions from the high processor and to transfer results to the high speed processor at the compeletion of the instructed operation by the ALU, said ALU requiring two operands for an instructed operation, wherein the arithmetic logic unit further comprises;

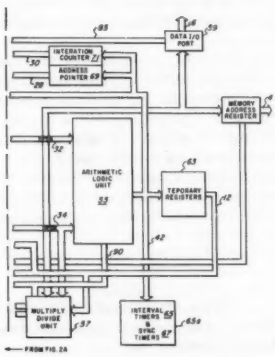
(1) a carry register means for indicating overflow status during operation by the arithmetic logic unit;

(2) a decrementing register means for counting the iteration executed by the operation of the arithmetic logic unit;

(3) means for providing signals to clock the carry register means and decrementing register means;

(4) means for (i) storing an iteration value in said decrementing register means, (ii) storing a value in said carry register means when an overflow condition exists, and





(iii) selecting the contents of said carry register means and the decrementing register means for transfer to said high speed processor;

(e) first memory means connected to said ALU to receive a first operand of the two operands from the high speed processor;

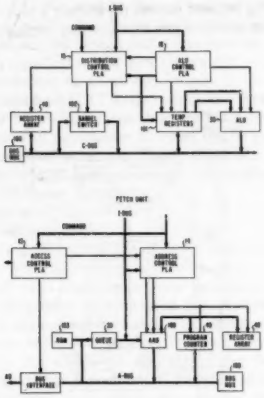
(f) second memory means connected to said ALU to receive a second operand of the two operands from the high speed processor;

(g) means for storing predetermined partial resultants from the operation of said arithemtic logic unit in said first memory means and said second memory means.

4,562,538
MICROPROCESSOR HAVING DECISION POINTER TO PROCESS RESTORE POSITION

Alan D. Berenbaum, Summit, N.J.; Anand Jagannathan, Hopkinton, Mass.; John J. Molinelli, Fair Haven, and Steven P. Pekarich, Eatontown, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 16, 1983, Ser. No. 494,776
Int. Cl.[4] G06F *9/00*
U.S. Cl. 364—200 **4 Claims**



1. A system for carrying out a current process, for allowing said process to be interrupted at a point of interruption before its completion, and for resuming the carrying out of said process either at the beginning of said process or at said point of interruption comprising:

a semiconductor integrated circuit microprocessor chip including a first register array for storing the hardware context of said current process and a second register array for storing instantaneous data being processed by said microprocessor during the execution of said current process;

a memory including a process control block (PCB) associated with said current process including a first block of bytes containing the context of said process at said point of beginning of said process and a second block of bytes containing the context of said process at said point of interruption of said process; and

control means for controllably restoring said current process, when interrupted, to the point of beginning or to the point of interruption when a process switch operation occurs.

4,562,539
DATA PROCESSING SYSTEM

Nigel L. Vince, Crewe, England, assignor to International Computers Limited, London, England

Filed Feb. 17, 1983, Ser. No. 467,384
Claims priority, application United Kingdom, Apr. 28, 1982, 8212262
Int. Cl.[4] G06F *15/16, 13/42*
U.S. Cl. 364—200 **8 Claims**

1. A data processing system comprising a plurality of processing nodes interconnected by data transmission means for receiving messages from the nodes and delivering the messages in the same sequence to all the nodes including the nodes which originated the messages, each node comprising:

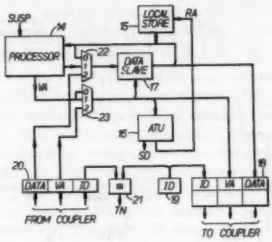
(a) a data store holding data items unique to the node and also holding a copy of each of a plurality of shared data items,

(b) a data processor coupled to the data store for reading and updating data items in the store,

(c) means responsive to the processor updating a shared data item, for generating a message containing the updated value of the data item and its address,

(d) means for transmitting the message over the transmission means,

(e) means for receiving messages from the transmission means,



(f) means responsive to the reception of a message originating from another node, for updating the shared data item identified by the address contained in the message,

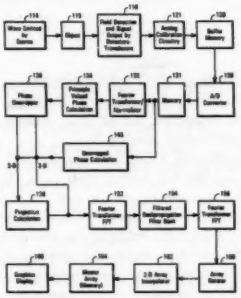
(g) means for producing a signal whenever a message has been generated by the node but has not yet been received back from the transmission means, and

(h) means operative upon reception of a message originating from another node, while said signal is present, for temporarily suspending operation of the processor.

4,562,540
DIFFRACTION TOMOGRAPHY SYSTEM AND METHODS

Anthony J. Devaney, Ridgefield, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Nov. 12, 1982, Ser. No. 441,323
Int. Cl.[4] G01V *5/00;* **G01N** *29/00;* **G06F** *15/42*
U.S. Cl. 364—400 **91 Claims**



1. A method for the reconstruction of an object which has diffracted at least one wave of energy propagating through it, said wave of energy being selected from a group consisting of sonic and electromagnetic waves, comprising the steps of:

(a) obtaining signals which are a function of at least one of the phase and amplitude of the diffracted propagating wave after said wave has interacted with said object; and

(b) converting said signals by means of a filtered backpropagation technique into an array representing a partial reconstruction of the object.

4. A method for the reconstruction of a three-dimensional object which has diffracted waves of energy propagating

through it at at least one view angle on a plane and for at least one planar orientation, comprising the steps of:

(a) obtaining signals which are a function of at least one of the phase and amplitude of each propagating wave after said wave has interacted with said object;

(b) preprocessing and separating said obtained signals to obtain sets of preprocessed signals, each set representing the signals obtained from the propagation of an energy wave at a separate view angle;

(c) converting said sets of preprocessed signals by means of a filtered backpropagation technique into arrays representing the partial reconstruction of the object; and

(d) interpolating each partial reconstruction onto a master array to obtain the two-dimensional reconstruction of a planar projection of the object.

25. A method for tomographic reconstruction of a two-dimensional object comprising:

(a) directing at a view angle one or more waves of energy toward an object being examained;

(b) detecting as a function of time the one or more fields produced by said one or more waves;

(c) producing one or more signals which are functions of said one or more detected fields; and

(d) filtering said produced signals according to a filtered backpropagation technique to generate a two-dimensional array representing the partial reconstruction of the object.

61. A method for tomographic reconstruction of a subsurface formation comprising:

(a) directing one or more waves of energy into said formation, the totality of said waves approximating one or more cylindrical waves of a given phase tilt;

(b) detecting as a function of time the one or more fields produced by said one or more waves;

(c) producing one or more signals which are functions of said one or more detected fields; and

(d) filtering said produced signals according to a filtered backpropagation technique to generate a two-dimensional array representing the partial reconstruction of the subsurface formation.

4,562,541

SYSTEM FOR CONTROLLING A POWER TRANSMISSION OF A FOUR-WHEEL DRIVE VEHICLE

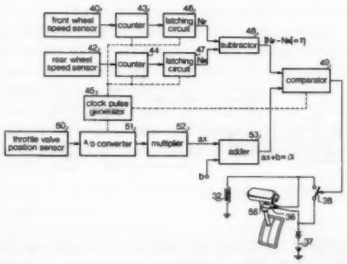
Ryuzo Sakakiyama, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 5, 1983, Ser. No. 482,299

Claims priority, application Japan, Apr. 9, 1982, 57-59868

Int. Cl.⁴ B60K *17/34, 23/08*

U.S. Cl. 364—424.1 **10 Claims**



10. In a system for controlling power transmission of a four-wheel drive vehicle having an engine, a transmission for transmitting power of said engine to main wheels of the vehicle, a throttle valve operatively connected to the engine, a clutch for selectively further transmitting said power to auxiliary wheels of the vehicle, first sensing means for sensing speeds of said main and auxiliary wheels and for producing output signals representative of speeds of said wheels, respectively, second sensing means for sensing the load on said engine, and a first computing circuit for producing a slip speed signal from the output signals of said first sensing means, the improvement comprising

a second computing circuit for producing a variable reference value as a function of the output of said second sensing means,

comparing means for comparing the slip speed signal and the variable reference value with each other and for producing a first signal when the slip speed signal is higher than the variable reference value, and

switch means responsive to said first signal of said comparing means for engaging said clutch, whereby four-wheel driving power transmission is established.

4,562,542

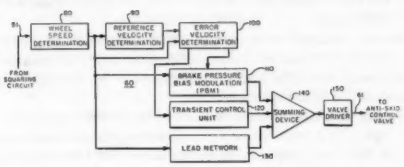
MODULATOR FOR ANTI-SKID BRAKING SYSTEM

Thomas Skarvada, Granada Hills, Calif., assignor to Crane Co., Chicago, Ill.

Continuation-in-part of Ser. No. 147,386, May 7, 1980, Pat. No. 4,338,669. This application Jul. 1, 1982, Ser. No. 394,484

Int. Cl.⁴ B60T *8/02, 8/10;* **G06F** *15/20*

U.S. Cl. 364—426 **26 Claims**



1. In an anti-skid braking system for modifying the action of a brake application means for a braked wheel of a vehicle, said system including means for utilizing information obtained from the rotation of said wheel to generate an input signal indicative of a braking condition; modulator means, responsive to the input signal, for generating a modulated brake control signal; means, included in the modulator means, for generating a rate signal as a function of both the input signal and a threshold signal; means, included in the modulator means, for generating the modulated brake control system as a time integral function of the rate signal; and means, responsive to the modulated brake control signal, for modifying the action of the brake application means; the improvement comprising:

means, included in the modulator means, for generating the threshold signal as a function of a velocity signal generally indicative of the velocity of the braked wheel such that the threshold signal is generated at a substantially constant value in a first range of velocities and the threshold signal is generated as a substantially increasing function of the velocity signal in a second range of velocities.

11. In an anti-skid braking system for modifying the action of a brake application means for a braked wheel of a vehicle, said system including means for utilizing information obtained from the rotation of said wheel to generate an input signal indicative of a braking condition; modulator means, responsive to the input signal, for generating a modulated brake control signal; and means, responsive to the modulated brake control signal, for modifying the action of the brake application means, the improvement comprising:

means, included in the modulator, for setting a rate signal to a first value when the input signal is indicative of a skid more severe than a first reference level and the elapsed time between consecutive values of the input signal indicative of wheel skids more severe than a second reference level is greater than a reference time;

means, included in the modulator, for setting the rate signal to a second value when the input signal is indicative of a skid more severe than the first reference level and the elapsed time between consecutive values of the input

signal indicative of wheel skids more severe than the second reference level is less than the reference time; and

means, included in the modulator means, for generating the modulated brake control signal as a time integral function of the rate signal.

21. In an antiskid braking system for modifying the action of a brake application means for a braked wheel of a vehicle, said system including means for utilizing information obtained from the rotation of said wheel to generate an input signal indicative of a braking condition; modulator means, responsive to the input signal, for generating a modulated brake control signal; and means, responsive to the modulated brake control signal, for mod'fying the action of the brake application means, the improvement comprising:

means, included in the modulator means, for classifying each value of the input signal in one of at least first, second and third ranges;

means, included in the modulator means, for classifying the frequency with which values of the input signal are classified in the third range as greater or less than a reference frequency;

means, included in the modulator means, for setting a rate signal to a first value corresponding to decreased action of the brake application means when the input signal is in the first range;

means, included in the modulator means, for setting the rate signal to a second value corresponding to decreased action of the brake application means when the input signal is in the second range;

means, included in the modulator means, for setting the rate signal to a third value corresponding to decreased action of the brake application means when the input signal is in the third range and the frequency is less than the reference frequency;

means, included in the modulator means, for setting the rate signal to a fourth value corresponding to decreased action of the brake application means when the input signal is in the third range and the frequency is greater than the reference frequency; and

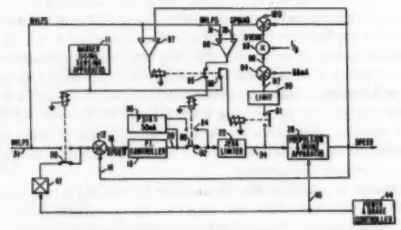
means, included in the modulator means for generating the modulated brake control signal as a time integral function of the rate signal.

4,562,543

VEHICLE SPEED CONTROL APPARATUS AND METHOD

Pierre A. Zuber, Baldwin, Pa., and Mario Rogers, Larkspur, Calif., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 4, 1983, Ser. No. 491,480
Int. Cl.³ B61L *3/18*
U.S. Cl. 364—426 **11 Claims**



1. In speed control apparatus for a vehicle moving along a track having a speed command signal and a program stop control signal, said vehicle being operative in one of a power mode and a brake mode, the combination of

means coupled with the vehicle for providing an actual speed signal,

means responsive to the speed command signal and the actual speed signal for calculating an effort request signal,

means responsive to the speed command signal and the actual speed signal for providing a power mode operation for a first value of the actual speed signal and a brake mode operation for a second value of the actual speed signal,

means responsive to the effort request signal for providing a speed offset signal,

means for comparing the program stop control signal with the sum of the actual speed signal and the speed offset signal to change from a power mode operation to a brake mode operation and to provide the effort request signal having no more than a predetermined maximum value to control said vehicle speed, and

means responsive to the actual speed signal being greater than said program stop control signal for controlling the vehicle speed in response to said calculated effort request signal.

7. In a method for the speed control of a vehicle operative with a track having a stop control signal and a desired speed signal, the steps of:

providing an actual speed signal in accordance with the actual speed of the vehicle,

determing a speed control signal in relation to the desired speed signal and the actual speed signal,

providing a speed offset signal in relation to the speed control signal,

providing a first speed control operation of the vehicle in response to a comparison of the stop control signal and the sum of the actual speed signal with the speed offset signal, and

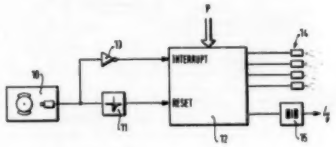
providing a second speed control operation of the vehicle in response to the actual speed signal being greater than the stop control signal.

4,562,544

CYCLICAL RESET OF VEHICULAR MICROCOMPUTERS FOR ECONOMIC ERROR IMMUNITY

Jörg Bonitz, Mühlacker; Robert Entenmann, Benningen; Géza Killi, Stuttgart; Rochus Knab, Kornwestheim; Bernhard Miller, Stuttgart; Siegfried Rohde, Schwieberdingen, and Walter Viess, Illingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 23, 1983, Ser. No. 507,056
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1982, 3224286
Int. Cl.⁴ H03K *5/13;* **F02D** *35/00, 37/02;* **G05B** *15/02*
U.S. Cl. 364—431.11 **4 Claims**



1. In a system comprising a microcomputer for controlling engine-speed-dependent operation of equipment of an internal combustion engine, of a motor vehicle, in response to operation conditions of said engine represented by electrical signals, said signals including at least one sequence of repetitive signals having a repetition rate not less than and synchronizing with the rate of revolution of a rotary body continuously dirven by said engine, said repetitive signals of said sequence being generated by a signal source having a rotary component body and an electrical output connection, and said microcomputer having a reset input for putting said microcomputer into a prede-

termined state suitable for beginning a computer operation, the improvement comprising:

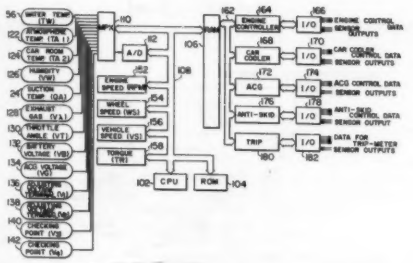
means for providing, by an electrical circuit connected to said signal source output connection, a reset signal to said reset input of said mircrocomputer in response to each of said repetitive signals of said sequence,

whereby the vulnerability by error of said system for controlling equipment of said engine is limited, for each error, to a duration not exceeding one revolution of said rotary component of said signal source.

4,562,545
METHOD OF TAKING-IN INPUT DATA FOR MOTORCAR CONTROL

Taiji Hasegawa, Nakaminato, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 28, 1982, Ser. No. 437,306
Claims priority, application Japan, Oct. 30, 1981, 56-172752
Int. Cl.[4] G05B 15/02; F02B 3/04
U.S. Cl. 364—431.12 **6 Claims**



1. For use in a motorcar controlling system having a plurality of sensors each for detecting respective analog data to produce a respective analog voltage output signal, a multiplexer connected to said sensors for selecting one of said sensors to produce only the analog voltage output signal of the selected sensor as an output thereof, an A/D converter for converting the output of said multiplexer into digital data and for producing the digital data as an output thereof, memory means for storing therein the output data of said A/D converter, and a plurality of digital controllers each operating on the basis of said digital data stored in said memory means and being capable of generating a request signal when data is desired from a selected sensor, a method of inputting data for controlling said motorcar comprising the steps of:

(a) storing in a first area of said memory means request signals recieved from said controllers so as to disignate selected sensors from which data is desired by said controllers;

(b) searching said first area of said memory means for a request signal;

(c) controlling said multiplexor to select a sensor on the basis of detection of a request signal in said first area of said memory means and initiating operation of said A/D converter;

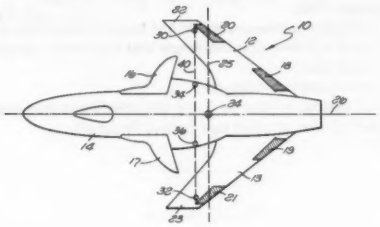
(d) storing the output of said A/D converter in a second memory area of said memory means as data; and

(e) transferring data stored in said second area of said memory means to the controller which generated the request signal initiating selection of the sensor from which the data was obtained, whereby said controller is operated on the basis of said data.

4,562,546
STABILITY AUGMENTATION SYSTEM FOR A FORWARD SWEPT WING AIRCRAFT

John H. Wykes, Rolling Hills Estates, and Gerald D. Miller, Long Beach, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 13, 1983, Ser. No. 457,618
Int. Cl.[4] B64C 5/08
U.S. Cl. 364—434 **14 Claims**



1. A system for augmenting stability of an aircraft having a fuselage and forward swept wings comprising:

a control surface mounted on each wing, said control surfaces positioned such that a plane substantially perpendicular to the fuselage center line and which passes through the nominal aircraft center of gravity also passes through said control surfaces;

wing sensors mounted near each of said control surfaces for providing first signals indicative of the motion of each wing;

fuselage sensor means mounted on the fuselage for providing second signals indicative of fuselage motion;

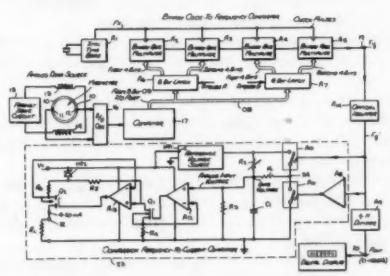
computer means responsive to said first and second signals to generate control signals indicative of wing structural motion; and

control means receiving said control signals for moving said control surfaces proportional to said control signals such that wing flexure and rigid body/wing bending flutter are suppressed with minimal resulting rigid body pitch motion inducing inputs.

4,562,547
COMPUTER DATA BUS COMPATIBLE CURRENT AND FREQUENCY OUTPUT SYSTEM

Herbert A. Shauger, Doylestown, Pa., assignor to Fischer & Porter Company, Warminster, Pa.

Filed Mar. 28, 1983, Ser. No. 479,321
Int. Cl.[4] G01R 23/02
U.S. Cl. 364—484 **11 Claims**



1. In combination with a computer whose central processing unit is adapted to process digital input data, the unit yielding at its output port parallel binary-coded data having an even num-

ber of bits which is applied to a data bus, a system operative with a variable data source generating input data in analog form and coupled to said bus to convert the binary-coded data to an output frequency suitable for indicating the variable data in a manner electrically isolating the output frequency from the computer and its associated data source, said system comprising:

A. means to convert the analog data from the source into digital data and to feed it into the input of the computer, whereby the binary data on the output bus represents the source data;

B. multiplier means to convert the binary-coded data on said bus to a conversion frequency that represents the binary-coded data;

C. a frequency divider; and

D. an optical isolator to apply the conversion frequency to said divider to yield said output frequency.

4,562,548

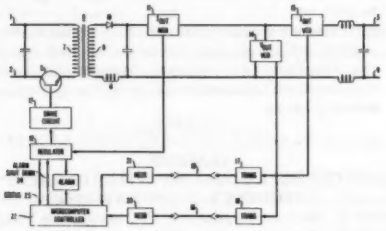
ALARM LIMIT RECENTERING ARRANGEMENT FOR MAINTAINING UNIFORM ALARM LIMIT TOLERANCES ABOUT A SLOPING REGULATION CHARACTERISTIC

Brad E. Andersen, Dover; Billy H. Hamilton, Summit, and Robert E. Schroeder, Flanders, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 12, 1983, Ser. No. 493,923

Int. Cl.⁴ G01R *19/165;* **H02H** *7/00*

U.S. Cl. 364—483 **6 Claims**



1. An alarm condition detection system controlled by a stored program control comprising:

means for monitoring an electrical signal amplitude to determine if an alarm limit has been reached,

information storage means including a table of alarm limits and stored program instructions for detecting an alarm limit,

means, responsive to the means for monitoring, for converting the electrical signal amplitude to a digital count value and transmitting the digital count value to the information storage means,

the stored program instructions including specific instructions for referencing values in the table of alarm limits to a present regulated operating point, the specific instructions including

a first instruction for recording a present operating point signal level and further calling a second instruction for computing new alarm limits and a third instruction for substituting the new alarm limits for present alarm limits in the table of alarm limits.

4,562,549

DIGITAL PLAYER USING A PULSE WIDTH DETECTOR

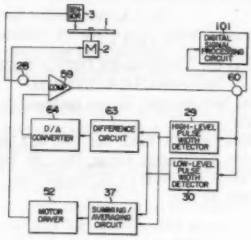
Hiromichi Tanaka; Hiroyuki Kimura; Tsutomu Noda; Takao Arai; Masaharu Kobayashi, all of Yokohama, and Shigeki Inoue, Toyokawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

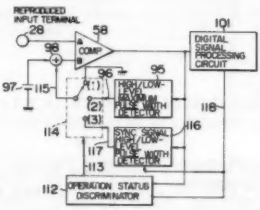
Filed Oct. 13, 1982, Ser. No. 434,058

Claims priority, application Japan, Oct. 14, 1981, 56-162834; Feb. 22, 1982, 57-26010; May 26, 1982, 57-87929

Int. Cl.⁴ H03K *5/01, 5/22*

U.S. Cl. 364—486 **25 Claims**





20. Digital player for reproducing a digital signal sequence including an information signal and a synchronizing signal having a specific pattern, comprising: a recording medium driven by a drive motor; a sensor for picking up a signal from the recording medium; a voltage comparator having a first input connected to receive the output of said sensor and a second input; a digital signal processing circuit connected to the output of said voltage comparator for deriving an analog signal corresponding to said information signal as well as the synchroniziong signal from said digital signal sequence; pulse width detection means connected to the output of said voltage comparator means for detecting the pulse width of each high and low level of said digital signal sequence; first latch means for selectively storing the pulse width data detected by said pulse width detection means; comparison means responsive to the pulse width data provided by said pulse width detection means and the data stored in said first latch means for controlling said first latch means to store received pulse width data when it represents a value greater than the value of the pulse width data already stored therein; operation status discriminator means connected to the output of said voltage comparator and said digital signal processing circuit for applying a control signal to operate said first latch means to store all pulse width data received from said pulse width detection means regardless

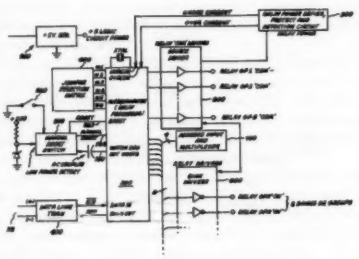
of the output of said comparison means when the detection rate of said synchronizing signal reaches a predetermined value; difference means connected to said first latch means for producing an output which indicates the difference between successive high and low level pulse widths of the digital signal sequence obtained from said first latch means; second latch means for storing the output of said difference means in response to receipt of a clock signal; clock signal selection means responsive to said control signal of said operation status discriminator means for applying a first clock signal having a selected low frequency to said second latch means and for applying a second clock signal having the higher frequency of said synchronizing signal to said second latch means upon receipt of a control signal; an adder having first and second inputs and an output which is connected to said second input of said voltage comparator; a fixed voltage source connected to said first input of said adder; and first switch means for selectively connecting said second input of said adder to ground potential or to the output of said second latch means.

4,562,550

REMOTE LOAD CONTROL RELAY PROCESSOR

Robert M. Beatty, Warwick; Paul G. Huber, and Edward B. Miller, both of West Warwick, all of R.I., assignors to General Electric Company, Bridgeport, Conn.

Filed Nov. 1, 1983, Ser. No. 547,619
Int. Cl.[4] H02J *3/10*
U.S. Cl. 364—492 **13 Claims**



1. In a system for controlling distributed electrical loads including a central controller for providing a data signal defining the manner in which said loads are to be controlled; plural transceiver devices, each device being connected to control a subset of said loads by controlling relays in respective power circuits of said loads; and a single data line connecting said central controller with each transceiver device, and improved transceiver device, comprising:

means for receiving, from said data line, said data signal requesting that the transceiver device cause a particular load control state to exist;

means, responsive to said receiving means, for determining which relays are required to be state changed in order to bring about the requested load control state;

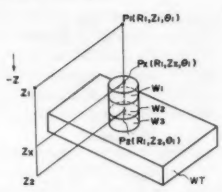
means, responsive to said determining means, for applying power in sequence to said relays to be state changed, with power being applied to each relay in sequence for a first duration of time, and after power has been applied once to each of said relays to be state changed, then again applying power in sequence to each of said relays to be state changed, each application of power being for a second duration of time greater than said first duration of time, said first duration of time being selected such that a substantial number of said relays to be state changed will respond to the initial application of power, allowing a user to perceive a substantially immediate response of the system to said data signal, the further application of power being for state changing relays not state changed by the first application of power thereto.

4,562,551

ROBOT CONTROL SYSTEM

Hajimu Inaba, Hino; Shinsuke Sakakibara, Kunitachi, and Ryo Nihei, Musashino, all of Japan, assignors to Fanuc Limited, Minamitsuru, Japan

PCT No. PCT/JP81/00383, § 371 Date Aug. 26, 1982, § 102(e) Date Aug. 26, 1982, PCT Pub. No. WO82/02437, PCT Pub. Date Jul. 22, 1982
PCT Filed Dec. 16, 1981, Ser. No. 414,355
Claims priority, application Japan, Dec. 30, 1980, 55-186748
Int. Cl.[4] G05B *19/00;* **B25J** *9/00, 13/00*
U.S. Cl. 364—513 **3 Claims**



2. A robot control system for moving a robot relative to a workpiece, comprising:

a robot controller operatively connected to the robot;

a pulse distributor, operatively connected to said robot controller, for producing distribution pulses;

a servo circuit operatively connected to said pulse distributor, said robot controller and the robot;

a sensor for detecting the position the robot relative to the workpiece and for producing a workpiece position signal when the robot and the workpiece are at a predetermined relative position; and

a gripping position arrival confirmation circuit; operatively connected to said sensor, said pulse distributor and the robot, for generating a deceleration signal at a predetermined time after the workpiece position signal is generated, said pulse distributor discontinuing the production of distribution pulses when the deceleration signal is generated.

4,562,552

METHOD AND APPARATUS FOR CONTROLLING PRESSURE AND FLOW IN WATER DISTRIBUTION NETWORKS

Shinichiro Miyaoka, Kawasaki; Teruji Sekozawa, Machida; Motohisa Funabashi, Sagamihara, and Shinobu Hayashi, Hitachi, all of Japan, assignors to Hitachi, Ltd. and Hitachi Control Systems Inc., both of Tokyo, Japan

Filed Feb. 1, 1983, Ser. No. 462,766
Claims priority, application Japan, Feb. 24, 1982, 57-27431
Int. Cl.[4] G05D *7/00;* **G05B** *13/02*
U.S. Cl. 364—510 **3 Claims**

1. In a water distribution network including a plurality of reservoirs, a plurality of flow meters for respectively measuring outlet flow rates of said reservoirs, a plurality of distributing pipes for interconnecting said reservoirs to demand nodes from which water is supplied to respective consumers, a plurality of pressure gauges for measuring respective pressures at selected points on said distributing pipes, and actuating means for varying said flow rates and pressures, a method for controlling the pressures at said selected points and the outlet flow rates of said reservoir comprising the steps of:

preparing a network model of said water distribution network;

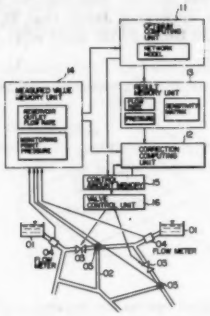
estimating demands at said demand nodes from the outlet flow rates measured by said flow meters;

computing control amounts of said actuating means based on the estimated demands at said demand nodes so as to obtain optimum values of said flow rates and said pressures according to said network model;

computing estimated flow rate and pressure values corresponding to said control amounts;

determining a sensitive matrix indicative of affects of small variation of said control amounts on said flow rates and said pressures according to said network model;

obtaining differences between said estimated flow rate and pressure values, the actual flow rate and pressure values



measured by said flow meters and said pressure gauges wherein said computed control amounts are applied to said actuating means;

correcting said control amounts by multiplying gains determined on said sensitive matrix; and

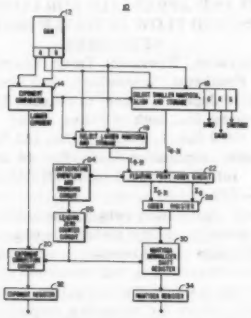
performing an operation by said actuating means in accordance with said corrected control amounts.

4,562,553

FLOATING POINT ARITHMETIC SYSTEM AND METHOD WITH ROUNDING ANTICIPATION

Bruno A. Mattedi, Andover, and Hiromichi Watari, Somerville, both of Mass., assignors to Analogic Corporation, Wakefield, Mass.

Filed Mar. 19, 1984, Ser. No. 591,199
Int. Cl.[4] G06F *7/50*
U.S. Cl. 364—745 **10 Claims**



1. A floating point arithmetic system with rounding anticipation comprising:

an arithmetic unit for arithmetically combining two mantissas;

a carry circuit for determining whether the sum will overflow upon the addition of two mantissas, and whether the difference will have a leading zero upon the subtraction of two mantissas; the subtrahend in subtraction and the augend in addition including guard, round and sticky digits;

a rounding circuit, responsive to the carry circuit, for designating for rounding the least significant digit of the sum when the sum will overflow and for designating for rounding the guard digit of the sum when the sum will not overflow; and for designating for rounding the round digit of the difference when the difference will have a leading zero and for designating for rounding the guard digit of the difference when the difference will not have a leading zero; and

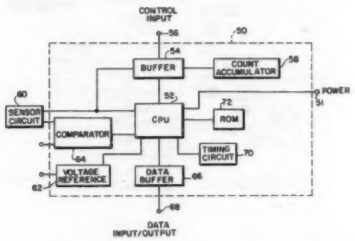
means, responsive to said rounding circuit, for introducing to said arithmetic unit at the designated digit during the arithmetic combining of the two manissas an amount equal to one half the radix to effect the rounding during the arithemtic operation.

4,562,554

UNIVERSAL MICROCOMPUTER FOR INDIVIDUAL SENSORS

Thomas E. Stixrud, and Barbara Sotirin, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 9, 1983, Ser. No. 502,797
Int. Cl.[4] G06F *15/00*; G01K *00/00*
U.S. Cl. 364—900 **20 Claims**



1. A universal microcomputer circuit for dedicated monitoring of individual sensors in an array of sensors, wherein a separate universal microcomputer is connected to each of said sensors in the chain, said universal microcomputer comprising:

a central processing unit;

memory means connected to the central processing unit, said memory means containing instructions and data;

means connected to the central processing unit for controlling timing of the circuit;

means for accumulating a count;

first buffering means connected between the central processing unit and a control input for buffering command signals coming in through the control input from a master control unit, said buffering means also connected to the means for accumulating a count;

second buffering means connected between the central processing unit and a data output terminal for buffering the data output from the central processing unit to the master control unit;

comparing means connected with its output to the central processing unit, for comparing a voltage difference between two inputs to said comparing means;

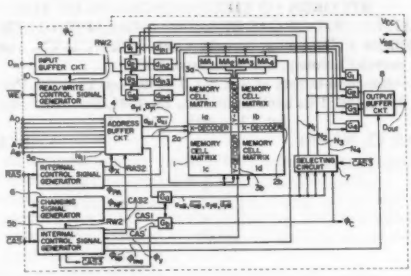
a voltage reference connected to a first input of said comparing means;

a sensor circuit connected with its first end to the central processing unit and the first buffering means, and with its second end having a voltage output connected to a second input to the comparing means.

4,562,555
SEMICONDUCTOR MEMORY DEVICE

Yoshiaki Ouchi, Tokorozawa; Masamichi Ishihara, Tokyo; Tetsuro Matsumoto, Tachikawa, and Kazuyuki Miyazawa, Kodaira, all of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering Ltd., both of Tokyo, Japan

Filed Sep. 23, 1983, Ser. No. 535,232
Claims priority, application Japan, Sep. 24, 1982, 57-164911
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—233 35 Claims



1. A semiconductor memory device comprising:

a memory cell array having a plurality of input-output terminals, in which a plurality of memory cells are selected substantially simultaneously and said memory cells thus selected are connected to said input-output terminals in a one-to-one manner;

a switch circuit having a plurality of input-output terminals provided so as to correspond and be connected to said input-output terminals of said memory cell array in a one-to-one manner, a plurality of control terminals, and a common input-output terminal selectively connected to one of said input-output terminals thereof;

an input-output circuit having an input-output terminal connected to said common input-output terminal of said switch circuit, an input terminal, and an output terminal, said input-output circuit outputting a signal from said input-output terminal thereof corresonding to a signal applied to said input terminal, or a signal from said output terminal corresponding to a signal applied to said input-output terminal thereof;

a control circuit outputting control signals; and

a selecting circuit receiving one of the control signals output from said control circuit and a plurality of signals corresponding to a plurality of address signals, and applying a plurality of selection signals to said control terminals of said switch circuit, for first selectively connecting a predetermined one of said input-output terminals of said switch circuit to said common input-output terminal and for thereafter selectively and sequentially connecting remaining input-output terminals of said switch circuit other than said predetermined one of said input-output terminals to said common input-output terminal.

4,562,556
COMPRESSIONAL AND SHEAR VELOCITY LOGGING METHOD APPARATUS

John D. Ingram, and Eileen E. Macknight, both of Houston, Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.

Filed Oct. 9, 1981, Ser. No. 310,333
Int. Cl.[4] G01V *1/40*
U.S. Cl. 367—26 22 Claims

20. A borehole logging system for measuring and determining the acoustic compressional and shear wave propagation velocities of waveforms transmitted through earth formations, comprising:

(a) an acoustic borehole logging tool having at least three serially spaced acoustic transducers, at least one of said transducers being an acoustic pulse transmitter and the remainder of said transducers being acoustic receivers,

(b) means for generating waveform outputs representative of the acoustic waves, from said logging tool acoustic pulses, propagated through different lengths of substantially the same formation intervals, and between different respective transmitter/receiver pairs, the waveforms being displaced in time according to their differential propagation times and rates therethrough,

(c) means for identifying an interval of expected first compressional wave arrival,

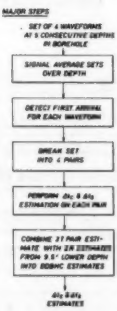
(d) means for detecting a known occurrence in at least one of the waveforms to determine coarse compressional wave first arrival times for each waveform,

(e) means for windowing the waveform outputs from at least two of the transmitter/receiver pairs in the vicinity of the respective said coarse compressional wave first arrival times,

(f) means for computing the frequency spectra of the windowed compressional waveforms,

(g) means for using the resulting compressional cross-spectral phase to refine and determine a final arrival time for the compressional waves,

(h) means for windowing one of the waveform outputs, from one of the pairs, for at least a portion of the expected shear waves therein,


MAJOR STEPS
SET OF 4 WAVEFORMS AT 5 CONSECUTIVE DEPTHS IN BOREHOLE
SIGNAL AVERAGE SETS OVER DEPTH
DETECT FIRST ARRIVAL FOR EACH WAVEFORM
BREAK SET INTO 4 PAIRS
PERFORM Δt_c & Δt_s ESTIMATION ON EACH PAIR
COMBINE 27 PAIR ESTIMATE WITH 2/6 ESTIMATES FROM 2 5' LOWER DEPTH INTO BOSHC ESTIMATES
Δt_c Δt_s ESTIMATES

(i) means for windowing the other waveform output from the other transmitter/receiver pair at a plurality of substantially equally distributed window time moveouts extending from substantially the earliest possible computed first shear wave arrival to substantially the earlier of the latest possible computed shear wave arrival time and the earliest expected fluid wave arrival time,

(j) means for computing the frequency spectra of the windowed waveforms, using the Discrete Fourier Transform, immediately after each waveform is windowed and prior to another windowing,

(k) means for computing, for both of the windowed waves, at each frequency, the cross-spectrum value as the product of the Discrete Fourier Transform sample of one of the waves with the conjugate of the other,

(l) means for interpolating zero phase from the phase versus time moveout data for at least a plurality of the higher energy frequency components produced by the Discrete Fourier Transform to determine the time moveouts which give cross-spectral phase of zero for each frequency,

(m) means for identifying a substantially contiguous frequency sub-band in which all the zero phase frequency components align consistently at substantially the same time moveout,

(n) means for selecting the time moveout of the center frequency component from this sub-band as a best shear window time moveout,

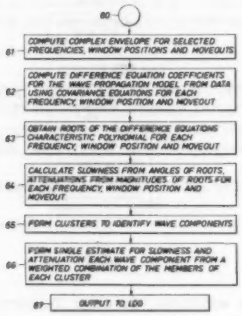
(o) means for rounding the best shear window time moveout to the nearest actual sampling time,
(p) means for rewindowing the other waveform output with the rounded best window time moveout,
(q) means for determining the Discrete Fourier Transform spectrum of the rewindowed waveform,
(r) means for determining the cross-spectrum of the two waveforms,
(s) means for using the cross-spectral phases for each frequency to define a refined best time moveout for each frequency,
(t) means for specifying a final shear window time moveout from at least one of the refined best time moveouts around the center of the same sub-band, and
(u) means for combining the transducer spacings, compressional arrival time, and final shear window time moveout to determine the compressional and shear wave propagation velocities of the earth formations.

4,562,557

METHOD AND APPARATUS FOR DETERMINING ACOUSTIC WAVE PARAMETERS FROM ACOUSTIC WELL LOGGING WAVEFORMS

Thomas W. Parks, and Charles F. Morris, Jr., both of Houston, Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.

Filed Apr. 27, 1982, Ser. No. 372,271
Int. Cl.[4] G01V *1/00*
U.S. Cl. 367—27 **20 Claims**


60
61
COMPUTE COMPLEX ENVELOPE FOR SELECTED FREQUENCIES, WINDOW POSITIONS AND MOVEOUTS
62
COMPUTE DIFFERENCE EQUATION COEFFICIENTS FOR THE WAVE PROPAGATION MODEL FROM DATA USING COVARIANCE EQUATIONS FOR EACH FREQUENCY, WINDOW POSITION AND MOVEOUT
63
OBTAIN ROOTS OF THE DIFFERENCE EQUATIONS CHARACTERISTIC POLYNOMIAL FOR EACH FREQUENCY, WINDOW POSITION AND MOVEOUT
64
CALCULATE SLOWNESS FROM ANGLES OF ROOTS, ATTENUATIONS FROM MAGNITUDES OF ROOTS FOR EACH FREQUENCY, WINDOW POSITION AND MOVEOUT
65
FORM CLUSTERS TO IDENTIFY WAVE COMPONENTS
66
FORM SINGLE ESTIMATE FOR SLOWNESS AND ATTENUATION EACH WAVE COMPONENT FROM A WEIGHTED COMBINATION OF THE MEMBERS OF EACH CLUSTER
67
OUTPUT TO LOG

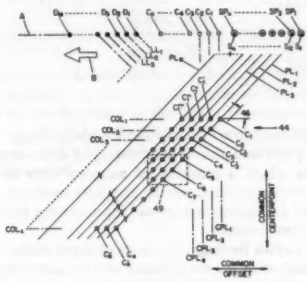
20. A system of estimating parameters of composite acoustic waves arriving sequentially at a plurality of points spaced vertically along the length of a borehole to produce a sonic log comprising:
(a) means for generating acoustic energy in the borehole,
(b) means for receiving the acoustic energy at each of the points after refraction, reflection and direct transmission through and along a formation adjacent the borehole,
(c) means for establishing a window of predetermined length and moveout,
(d) means for positioning said window along the wave,
(e) means for multiplying the energy received at each point by the window,
(f) means for generating the Fourier transform of that portion of received energy multiplied by the window, to produce a plurality of complex signals in the frequency domain,
(g) means for modeling said complex signals as the sum of exponentials with unknown spatial frequencies,
(h) means for determining the spatial frequencies using a Prony estimation algorithm,
(i) means for calculating the slowness for each spatial frequency, at each of a plurality of temporal frequencies,
(j) means for selecting the best estimate of slowness, and
(k) means for plotting said best estimate as a function of depth to produce a sonic log.

4,562,558

METHOD FOR INTERPRETATION OF SEISMIC RECORDS TO YIELD INDICATING OF THE LITHOLOGY OF GAS-BEARING AND CAPPING STRATA

William J. Ostrander, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 77,240, Sep. 19, 1979, Pat. No. 4,316,268. This application Oct. 28, 1981, Ser. No. 316,013
Int. Cl.[4] G01V *1/34, 1/36*
U.S. Cl. 367—68 **15 Claims**

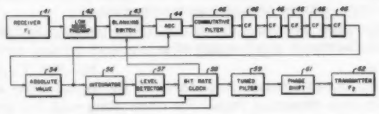


1. A method for determining lithology of gas-bearing strata in the earth using high-intensity amplitude events in seismic records, comprising the steps of:
(a) generating seismic data, including a record of signals from acoustic discontinuities associated with said strata of interest by positioning and employing an array of sources and detectors such that centerpoints between selected pairs of sources and detectors form a series of centerpoints along a line of survey, said recorded signals being the output of said detectors;
(b) by means of automated processing means, statically and dynamically correcting said recorded signals to form corrected traces whereby each of said corrected traces is associated with a centerpoint horizontally midway between a source-detector pair from which said each corrected trace was originally derived;
(c) by means of automated processing means, indexing said corrected traces in two dimensions whereby each of said corrected traces is identified in its relationship to neighboring traces on the basis of progressive changes in horizontal offset value versus progressive changes in common centerpoint location;
(d) displaying a series of said traces of step (c) on a side-by-side basis as a function of progressively changing horizontal offset values, said displayed traces all being associated with at least the same general common group of centerpoints whereby progressive change in a high-intensity amplitude event from trace to trace of said displayed traces as a function of progressive change in horizontal offset value, more likely than not relates to reflections from acoustic discontinuities associated with strata containing gaseous hydrocarbons; and
(e) determining lithologic character of the strata containing the gaseous hydrocarbons based on the direction of the progressive change in the amplitude event as a function of horizontal offset.

4,562,559
BOREHOLE ACOUSTIC TELEMETRY SYSTEM WITH PHASE SHIFTED SIGNAL

H. Eugene Sharp, Missouri City, and Miles A. Smither, Houston, both of Tex., assignors to NL Sperry Sun, Inc., Stafford, Tex.

Continuation of Ser. No. 226,570, Jan. 19, 1981, abandoned. This application Oct. 17, 1983, Ser. No. 510,532
Int. Cl.[4] G01V *1/40*
U.S. Cl. 367—82 5 Claims



4. An acoustic telemetry system for sending acoustic signals over a drill string suspended in a borehole, comprising:

acoustic transmitting and receiving means positioned at spaced apart locations in the drill string, said transmitting means being arranged to transmit an acoustic signal for a fixed time period;

means for phase shifting said signal at least one known time within said fixed time period;

filter means for sequentially comparing portions of a received signal with the transmitted signal over said fixed time period;

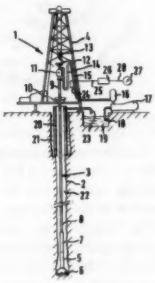
means for shifting the sequence of said sequentially comparing filter means to correlate the operation of said filter means with the phase shift of the transmitted acoustic signal; and

a control logic circuit for incorporating a delay of said signal through the receiving means and supplying a signal to the sequence shifting means to affect correlation of the filter means with the phase shift in the received signal.

4,562,560
METHOD AND MEANS FOR TRANSMITTING DATA THROUGH A DRILL STRING IN A BOREHOLE

Anthony W. Kamp, Rijswijk, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 28, 1982, Ser. No. 425,150
Claims priority, application United Kingdom, Nov. 19, 1981, 8134886
Int. Cl.[4] G01V *1/40*
U.S. Cl. 367—83 5 Claims



1. A method of transmitting data through a drill string in a borehole extending from the surface of the earth to an underground formation, wherein drilling mud is passed through the drill string, which drilling mud actuates a downhole mud motor of the positive displacement type carried by the drill string, which method includes the sequential steps of:

measuring values of at least one parameter down the hole;

encoding the measured values in patterns of electric signals;

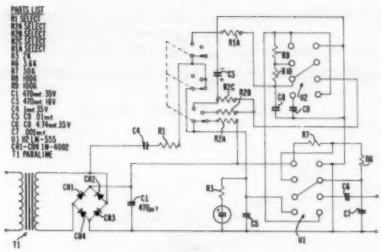
varying the load on the downhole mud motor by means of the electric signals, thereby generating successive pressure pulses in the flow of drilling mud in patterns representative of the patterns of the electric signals; and

detecting the patterns of pressure pulses at the surface and generating signals representative of the measured values in a readable or storable form.

4,562,561
ULTRASONIC PEST REPELLER

Paul S. Ackley, 1270 S. Stelling, Cupertino, Calif. 95014

Filed Jun. 17, 1983, Ser. No. 505,470
Int. Cl.[4] H04B *1/02*
U.S. Cl. 367—139 7 Claims



1. Apparatus for use in repelling animal pests comprising:

a circuit having means for generating a first electronic signal in an ultrasonic frequency range, a second electronic signal in an ultrasonic frequency range, and a third electronic signal in an ultrasonic frequency range; said circuit further including means including a switch coupled with said signal generating means for selectively actuating the latter to cause the generation of a selected one of the first, second and third signals, there being means for modulating the selected signal, whereby the selected signal will have a bandwidth as a function of the modulation thereof, said circuit having an output, said first signal having a fundamental frequency of approximately 22 kHz and, upon being modulated by said modulating means, being variable in frequency in the range of approximately 18 kHz to 30 kHz, said second signal having a pair of fundamental frequencies of approximately 22 kHz and 35 kHz, respectively, said second signal, upon being modulated by said modulating means, having its lower fundamental frequency variable from approximately 18 kHz to 30 kHz and having its higher fundamental frequency variable from approximately 28 kHz to 50 kHz, the second signal changing between the lower and higher fundamental frequencies at a predetermined rate, said third signal having a plurality of fundamental frequencies in the range of 18 kHz to 33 kHz, there being means in the circuit for sweeping through said fundamental frequencies at a predetermined rate, said third signal upon being modulated, having each of its fundamental frequencies variable over a respective frequency range, the lowermost fundamental frequency of approximately 18 kHz, having a frequency range of approximately 16 kHz to 21 kHz, the uppermost fundamental frequency of approximately 33 kHz, having a frequency range of approximately 31 kHz to 42 kHz; and

an ultrasonic transducer coupled to the output of the circuit for converting the electronic signals to ultrasonic signals.

4,562,562

TRACKING SYSTEM FOR CONTROLLING THE RADIAL POSITIONING OF A TRANSDUCER ON A DISC MEDIUM

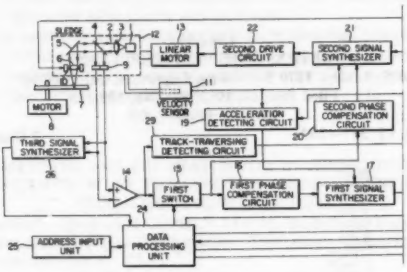
Mitsuro Moriya; Toshiji Kanamaru, both of Osaka, and Yoshinobu Nakata, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

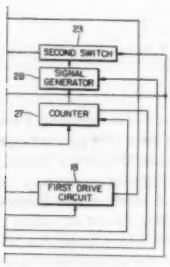
Filed Mar. 24, 1983, Ser. No. 478,443

Claims priority, application Japan, Mar. 26, 1982, 57-49556

Int. Cl.⁴ G11B *7/00, 21/08, 21/10*

U.S. Cl. 369—32 **8 Claims**





1. A tracking system for controlling the radial positioning of a transducer means on a disc information medium, comprising:

(a) transducer means for writing and/or reading data onto or out of the disc information medium with a track or a multiplicity of tracks along which data are to be written or recorded;

(b) fine driving means for displacing the scanning position of said transducer means in the radial direction substantially perpendicular to the direction of said track or tracks on said information medium;

(c) coarse driving means driven by current for displacing said fine driving means in the radial direction substantially perpendicular to the direction of said track or tracks on said information medium;

(d) first error detection means for generating a position error signal indicative of the displacement of the scanning position of said transducer means from the center of a track on said information medium;

(e) second error detection means coupled to receive information indicative of a commanded scanning position of said transducer means and an actual scanning position of said transducer means and generate a position error signal indicative of the difference therebetween;

(f) first control means responsive to the signal from said first error detection means for controlling said fine driving means in such a way that the scanning position of said transducer means can always be positioned above a track on said information medium;

(g) second control means responsive to the signal from said first error detection means for controlling said coarse driving means in such a way that said fine driving means can be generally positioned at the center of its displacement range;

(h) switch means for making said first and second control means inoperative;

(i) third control means responsive to the signal from said second error detection means for controlling said coarse driving means while said first and second control means are made inoperative in such a way that the scanning position of said transducer means can be moved in a direction tending to reduce the difference between the commanded and actual scanning positions of said transducer means;

(j) acceleration detecting means for detecting and indicating the displacement acceleration of said coarse driving means; and

(k) fourth control means responsive to the signal from said acceleration detecting means for controlling said fine driving means while said first and second control means are made inoperative in such a way that the force of inertia exerted on said fine driving means due to the displacement of said coarse driving means can be substantially counteracted.

4,562,563

RECORD-DISC PLAYER COMPRISING A BRAKING MECHANISM FOR BRAKING A DISC

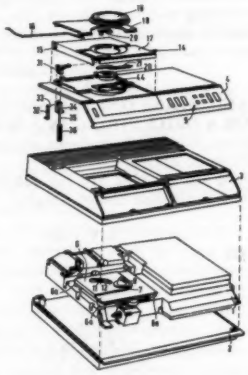
Jan W. Arets, and Bernardus J. Stinessen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 23, 1984, Ser. No. 583,070

Claims priority, application Netherlands, Feb. 28, 1983, 8300731

Int. Cl.⁴ G11B *1/00*

U.S. Cl. 369—79 **6 Claims**



1. A record-disc player with a braking mechanism for braking a record disc, the player comprising a housing, a turntable which is rotated by a motor, and a lid which is pivotally connected to the housing and means for latching said lid in a closed position relative to the housing, said means for latching including a latching mechanism, said payer also including means for loading a disc, the braking mechanism being operable to stop the disc after the lid has been unlatched and comprising a brake lever which is pivotable about a pivotal axis and which cooperates with the lid and which is provided with a braking element and a stop element on opposite sides of the pivotal axis of the brake lever, the brake lever being pivotally connected to the lid, the braking element cooperating with the means for loading a disc and the stop element cooperating with a stop portion of the housing, and the means for latching including means for releasing responsive to exertion of pressure on the lid in response to which the lid performs a pivotal movement towards the housing, the stop element is urged

against the stop portion, the brake lever is pivoted relative to the lid, and the braking element stops the disc by exerting a braking torque on the disc loader.

4,562,564

PROCESS AND OPTICAL DEVICE FOR GENERATING SIGNALS CONTROLLING THE POSITION OF A SCANNING SPOT OF THE TRACKS OF A DATA CARRIER

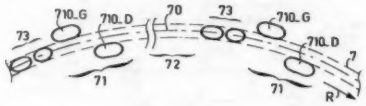
Claude Bricot; Pierre Bérthet, and Jean-Louis Gérard, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Mar. 9, 1983, Ser. No. 473,539

Claims priority, application France, Mar. 12, 1982, 82 04221

Int. Cl.⁴ G11B *7/00*

U.S. Cl. 369—44 **16 Claims**



1. A data carrier having a plurality of adjacent track elements for digital data storage in allotted non-contiguous portions of said track elements on a reference surface, said data carrier comprising:

prerecorded first flag means repeatedly arranged along first further portions of each one of said track elements for delineation of a mean axis of scan thereof;

prerecorded second flag means repeatedly arranged along second further portions of each one of said track elements for synchronization of the lengthwise scanning of said track elements with an illuminating spot focused on said reference surface;

both said first and second further portions being intermediate said non-contiguous portions;

both said first and second flag means being made of spaced island shaped marks having on said reference surface a closed outline of substantially uniform width measured transversely of said mean axis of scan;

each of said first flag means comprising at least one of said island shaped marks offset in relation with said mean axis of scan;

each of said second flag means comprising at least two of said marks succeeding one another for forming a specific array distinguishable by its mark lengths and spacing from any other data entity available on said reference surface.

4,562,565

TRACKING SERVO SYSTEM

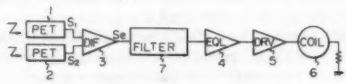
Kunio Tamura, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 13, 1982, Ser. No. 417,497

Claims priority, application Japan, Sep. 14, 1981, 56-135433[U]

Int. Cl.⁴ G11B *21/10*

U.S. Cl. 369—44 **4 Claims**



1. In a tracking servo system of a recording-disc reading apparatus in which a recording disc having an information-carrying surface is rotatably driven about the center axis of said disc and is read by a signal pickup point displaced radially of the disc and directed onto said information-carrying surface, the line velocity of said signal pickup point relative to said information-carrying surface being kept constant notwithstanding the radial position of said signal pickup point with respect to said disc, the improvement comprising:

a tracking error signal generating means is operative to detect an amount and direction of deviation, if any, of the signal pickup point from a target track on the information-carrying surface of the recording disc and produce a tracking error signal representative of the detected amount and direction of deviation, said tracking error signal generating means being adapted to provide a pair of index points respectively residing at both sides of said signal pick-up point and to produce a pair of signals respectively representing distances of said index points from said target track, and

a band eliminating means operative to eliminate a predetermined frequency in the tracking error signal, said predetermined frequency being selected depending upon the line velocity of rotation of the recording disc and the tangential distance between the index points.

4,562,566

DISC PLAYER

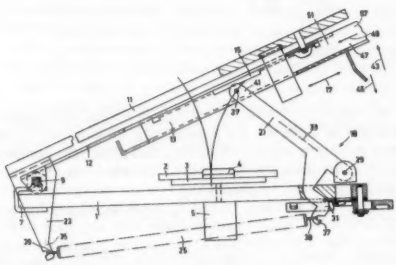
Kurt Eisemann, Berlin, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 28, 1983, Ser. No. 479,306

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1982, 3211358

Int. Cl.⁴ G11B *17/04, 19/16*

U.S. Cl. 369—75.2 **2 Claims**



1. A disc player for an information-carrying disc inserted into the player, comprising

a chassis,

a turntable rotatably journalled to the chassis,

a lid, having a projecting arm extending therefrom,

a hinge pivotally connecting the lid to the chassis for pivotable movement of the lid between first and second positions about a hinge axis located near said arm,

a slide, mounted to the lid for slidable movement away from and toward the hinge between a loading position and an outer position in which the slide is farther from the hinge axis, said slide at least partly bounding a compartment arranged for receiving a disc, in said outer position said compartment extending beyond said lid such that the disc can be readily removed,

means for moving the slide from the loading position to the outer position as the lid is pivoted from the first position to the second position, said means including a lever having an arm with an end portion and having an extension member, said lever being pivotably connected to the chassis at a pivot location remote from said hinge axis; and means pivotably connecting said arm end portion to said slide, arranged such that, when the lid is in the first position, the arm extends from said pivot location toward the hinge axis, and as the lid pivots from the first to the second position, the lever pivots with respect to the chassis, and said slide and lever arm end portion move away from the hinge axis, and

a spring connected between said projecting arm and said extension member so as to bias the lid in the direction of pivoting from the first to the second position,

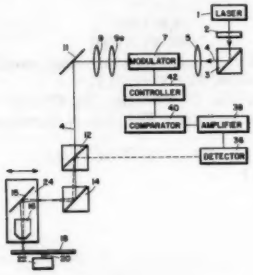
in said first position of the lid said compartment being so disposed that a disc received therein is adjacent said turntable.

4,562,567

APPARATUS FOR CONTROLLING THE WRITE BEAM IN AN OPTICAL DATA RECORDING SYSTEM

Eric J. Frankfort, Yorktown Heights; George C. Kenney, II, Ossining, and Robert McFarlane, New Rochelle, all of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Filed Nov. 12, 1982, Ser. No. 440,897
Int. Cl.[4] G11B *7/00*
U.S. Cl. 369—106 **6 Claims**



1. An apparatus for recording data in a form detectable by a read beam of radiation on a recording medium which comprises a radiation sensitive material, said apparatus comprising means for directing a write beam of radiation onto the recording medium; means for producing relative movement between said write beam and said recording medium; means for modulating said write beam in accordance with the data to be recorded so that said write beam records the data on the recording medium by forming thereon a pattern of spaced apart data spots arranged in an elongated track, said data spots being produced by said write beam forming pits in said radiation sensitive material; means for detecting the reflected beam caused by said write beam when it strikes said recording medium; means for determining the intensity of said reflected beam; and control means responsive to the intensity of said reflected beam for reducing the intensity of said write beam whenever said intensity determining means indicates that pit formation has been initiated.

4,562,568

BEAM COMBINING AND SEPARATING APPARATUS USEFUL FOR COMBINING AND SEPARATING READING AND WRITING LASER BEAMS IN AN OPTICAL STORAGE SYSTEM

Robert L. Hazel, Thousand Oaks, and Gilbert Y. Chan, Agoura, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

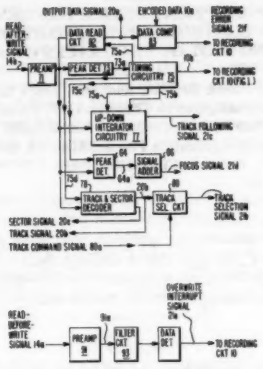
Filed Sep. 9, 1982, Ser. No. 416,420
Int. Cl.[4] G11B *7/00*; G02B *27/10, 27/14*
U.S. Cl. 369—112 **15 Claims**

1. Apparatus useful for combining and/or separating radiation beams, said apparatus comprising:

a thin element which is transparent at the wavelength of a first beam to be directed thereto;

a reflective coating provided on one side of said element which is reflective at the wavelength of a second beam to be directed thereto;

said reflective coating having an opening therein extending to said element so as to permit said first beam to be transmitted through said device via said element and said opening without change in its direction and to permit said second beam to impinge on said reflective coating and be reflected thereby; and



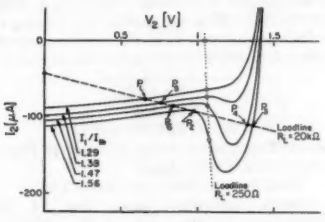
a coating which is anti-reflective at the wavelength of said first beam provided on the side of said element opposite from said reflective coating.

4,562,569

TANDEM COUPLED CAVITY LASERS WITH SEPARATE CURRENT CONTROL AND HIGH PARASITIC RESISTANCE BETWEEN THEM FOR BISTABILITY AND NEGATIVE RESISTANCE CHARACTERISTICS AND USE THEREOF FOR OPTICAL DISC READOUT

Amnon Yariv, San Marino; Christoph Harder, and Kam-Yin Lau, both of Pasadena, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Jan. 5, 1982, Ser. No. 337,096
Int. Cl.[4] G11B *7/00*; H01S *3/19*
U.S. Cl. 369—122 **27 Claims**



1. A bistable optical element comprising:

a two-segment contact laser having first and second contacts definable as the gain contact and the absorber contact, said laser being characterized by a parasitic resistance significantly greater than 1 kilohm between said contacts, definable as R_p, said parasitic resistance being sufficient to produce very good electrical separation between contacts so that the absorber contact appears to be driven by nearly a pure current source, means for biasing said absorber contact for a current I_2 with a voltage V_2, said biasing means having an output impedance R_2, and means for biasing said gain contact with current I_1, the I_2 and V_2 relationship being representable by curves for various values of the gain contact current I_1 over the laser threshold current, definable as I_{th}, and said parasitic resistance R_p of said laser and said output impedance provides an

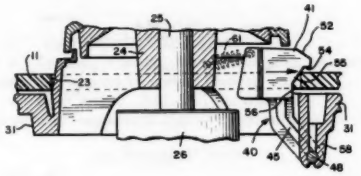
effective load resistance R_L, where $R_L=R_pR_2/(R_p+R_2)$, whereby R_L is large enough so that its loadline intersects the characteristic curves of the absorber current I_2 versus the voltage V_2 at more than one point.

4,562,570

VIDEO DISC TURNTABLE HAVING CLAMPING DEVICE

Jerry N. Denton, Knoxville, Tenn., assignor to North American Philips Consumer Electronics Corp., New York, N.Y.

Filed Nov. 28, 1983, Ser. No. 555,740
Int. Cl.⁴ G11B *9/06*
U.S. Cl. 369—270 **5 Claims**



1. A turntable system for a recording disc of the type having a spindle aperture provided centrally therein, comprising:

a rotary driven turntable for rotating the disc;

a generally cylindrical hub affixed to and extending perpendicularly upward from the turntable, said hub being disposed so that its central axis is aligned with the axis of rotation of the turntable and so dimensioned as to be received within the spindle aperture provided in the recording disc; and

at least one clamp member disposed along the outer circumference of said hub pivotally attached thereto, said clamp member being mounted for relative lateral motion with respect to said hub along a path extending radially from the axis of rotation thereof, so that rotation of said hub causes said clamp member to pivot outwardly from the circumference of said hub to engage the recording disc, thereby automatically clamping the disc to the turntable; and

wherein said clamp member includes a substantially vertical leg portion and a downwardly sloped leg portion integrally formed and axially aligned with said vertical leg portion at the lower end thereof, said clamp member further including a weighted head portion attached to the upper end of said vertical leg portion and a pivot assembly formed at the lower outer most end of said downwardly sloped leg portion for pivotally attaching said clamp member to said hub, the point of pivotal attachment of said clamp member to said hub being more radially distant from the axis of rotation of said hub than the distance of said weighted head portion from said axis of rotation whereby said clamp member tends naturally to pivot toward said axis of rotation when the rotational angular velocity of said hub falls below a predetermined value.

4,562,571

SPEECH PROCESSING DEVICE FOR RADIOELECTRIC EQUIPMENT ADAPTED FOR SPEECH TRANSMISSION AND RECEPTION

Pierre Deman, Paris, and Jean Potage, Franconville, both of France, assignors to Thomson CSF, Paris, France

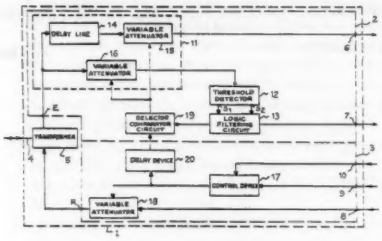
Filed Dec. 7, 1983, Ser. No. 558,888
Claims priority, application France, Dec. 10, 1982, 82 20764
Int. Cl.⁴ H04B *3/20*
U.S. Cl. 370—7 **14 Claims**

13. A speech processing device for processing reception voice signals from a radio transmitter/receiver having an auxiliary channel into expanded voice signals and processing transmission voice signals into compressed voice signals to be applied to said radio transmitter/receiver, comprising:

means for compressing a volume range of said transmission voice signals to form said compressed voice signals, said compressing means including at least one variable transmission attenuator;

means for expanding a volume range of said reception voice signals to provide said expanded voice signals; and

processing means for (1) controlling said expanding means in accordance with attenuation information from said radio transmitter/receiver auxiliary channel, (2) controlling said



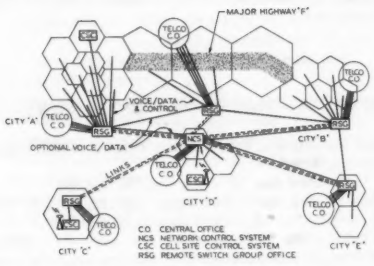
at least one variable transmission attenuator to maintain said compressed voice signals at a substantially constant level and for providing attenuation values to said radio transmitter/receiver auxiliary channel, said processing means causing said attenuation values to vary in substantially constant steps corresponding to a variation in a level of said transmission voice signals, and (3) determining a highest value of (a) said attenuation values, and (b) said attenuation information, and for adjusting said at least one variable transmission attenuator to a value of attenuation corresponding to said highest value.

4,562,572

CELLULAR MOBILE RADIO SERVICE TELEPHONE SYSTEM

Stuart O. Goldman, Columbus; Erik A. Lissakers, Perrysville, and Matthew W. S. Thomson, Worthington, all of Ohio, assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jan. 11, 1983, Ser. No. 457,155
Int. Cl.⁴ H04J *6/02*; H04B *7/00*
U.S. Cl. 370—80 **9 Claims**



4. A communications system comprising:

a network control system;

a plurality of remote switch groups each coupled directly to said network control system;

a plurality of cell sites each comprising a plurality of transceivers, some of said cell sites are associated with a respective remote switch group, the transceivers in said some of said cell sites are coupled directly to an associated one of

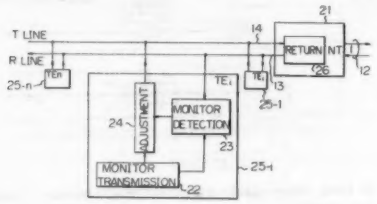
said remote switch groups, the transceivers in the remaining cell sites that are not associated with said remote switch groups are directly coupled to said network control system.

4,562,573

METHOD AND APPARATUS FOR ADJUSTING CHANNEL INSERTION TIMING

Kazuo Murano, Tokyo; Tetsuo Soejima, Musashino, and Shigeo Amemiya, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 20, 1983, Ser. No. 533,968
Claims priority, application Japan, Sep. 22, 1982, 57-165579
Int. Cl.[4] H04J *3/02, 3/06*
U.S. Cl. 370—85 **27 Claims**



1. A method for adjusting channel insertion timing in an information communication system, the system having a plurality of terminal equipment units connected by a bus connection to a single network termination unit via a common R (receiving) line and a common T (transmitting) line on which successive frame signals are transferred, each of the frame signals on the R line containing therein a frame synchronization signal, each of the frame signals on both T and R lines also containing multiple successive channels, each terminal equipment unit receiving information with each frame signal on the R line, at a timing corresponding to the channel allotted thereto, transmitted from the single network termination unit, and each terminal equipment unit transmitting information with each frame signal on the T line, at a timing corresponding to the allotted channel in reference to a just received frame synchronization signal, to the single network termination unit, said method comprising performing a learning identification algorithm operation prior to actual communication through with a suitable variable clock signal delay time is determined regarding the channel intersection timing in each terminal equipment unit such that overlap between adjacent channels being prevented.

4,562,574

FRAME SYNCHRONIZING SIGNAL INSERTION SYSTEM

Yuusaku Kambayashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 13, 1983, Ser. No. 484,685
Claims priority, application Japan, Apr. 22, 1982, 57-67794
Int. Cl.[3] H04J *3/06*
U.S. Cl. 370—100 **3 Claims**

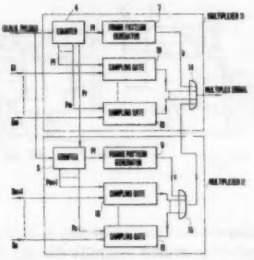
1. A frame synchronizing signal insertion system at a transmitting end comprising a plurality of multiplex converting means each of which has time division means and multiplex gate means, said time division means comprising:

timing clock generating means for receiving a frequency-dividing clock signal and for generating a first timing pulse signal which indicates a time at which a frequency-divided frame synchronizing signal is inserted and at least one second timing pulse signal which indicates a time at which an input digital signal is subject to time division;

at least one sampling means for sampling the input digital signal in response to said at least one second timing pulse signal and for producing a time division signal; and

frame pattern generating means for generating the frequency-divided frame synchronizing signal which has a predetermined pattern at the time indicated by the first timing pulse signal, said pattern including at least one pulse, said multiplex gate means receiving at least the frequency-divided frame synchronziing signal and the time division signal so as to produce a single multiplex signal in accordance with a given frame pattern wherein said multiplex gate means of said plurality of multiplex converting means include:

a first multiplex gate which receives at least one corresponding time division signal and a corresponding frequency-divided



frame synchronizing signal having a first frame pattern so as to produce a first composite multiplex signal which has the first frame pattern; and

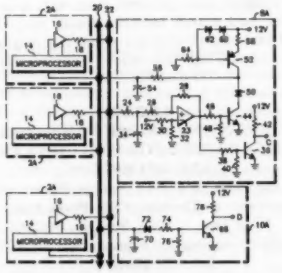
at least one second multiplex gate which receives at least one other corresponding time division signal, another corresponding frequency-divided frame synchronizing signal having a second frame pattern, and the first composite multiplex signal so as to produce a second composite multiplex signal having a composite frame pattern which is obtained by logic-ORing the frequency-divided frame synchronizing signals having the first and second frame patterns which differ from each other, said at least one second multiplex gate transmitting the second composite multiplex signal to the receiving end.

4,562,575

METHOD AND APPARATUS FOR THE SELECTION OF REDUNDANT SYSTEM MODULES

Greg M. Townsend, Palatine, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 7, 1983, Ser. No. 511,701
Int. Cl.[4] G06F *11/20*
U.S. Cl. 371—9 **13 Claims**



1. A system for the selection of at least one redundant module from a plurality of redundant modules, comprising:

a plurality of voting means, each of said voting means coupled to each of the redundant modules for diagnosing the operation of an active redundant module from said plurality of redundant modules and for generating a vote indicating either to transfer operation from said active redundant module or to retain operation of said active redundant module, said plurality of voting means being cooperatively intercoupled such that each respective vote generated combines to form a collective vote;

control means, connected to said plurality of voting means and said plurality of redundant modules, for receiving said collective vote of said plurality of voting means and for selecting one of said plurality of redundant modules to be active in accordance with said collective vote.

4,562,576

DATA STORAGE APPARATUS

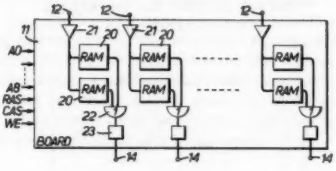
Michael J. Ratcliffe, Cheadle Hulme, England, assignor to International Computers Limited, London, England

Filed Aug. 1, 1983, Ser. No. 518,946

Claims priority, application United Kingdom, Aug. 14, 1982, 8223439

Int. Cl.⁴ G06F *11/10*

U.S. Cl. 371—21 **3 Claims**



1. Data storage apparatus comprising:

(a) a plurality of memory devices each having a plurality of individually addressable bit storage locations, the memory devices being arranged in a plurality of columns,

(b) output means coupled to said memory devices, for reading out a bit from each said column to provide a multi-bit output data word,

(c) error detecting means coupled to the output means for detecting n bit errors in said multi-bit output data word, where n is greater than one, and for generating an error signal upon detection of an arror,

(d) a signal input path for inputting a control signal, and

(e) a plurality of driver circuits each having an input connected to said input path to receive the control signal and an output connected to the memory devices in no more than n of said columns, at least some of the driver circuits having their outputs each connected to the memory devices in at least two of said columns, whereby, if any one of said driver circuits fails, no more than n bits in said output data word are corrupted and hence the failure can be detected by the error detecting means.

4,562,577

SHARED ENCODER/DECODER CIRCUITS FOR USE WITH ERROR CORRECTION CODES OF AN OPTICAL DISK SYSTEM

Neal Glover, Broomfield; Michael J. O'Keeffe, Longmont, and S. Robert Perera, Boulder, all of Colo., assignors to Storage Technology Partners II, Louisville, Colo.

Filed Sep. 19, 1983, Ser. No. 533,828

Int. Cl.⁴ G06F *11/10*

U.S. Cl. 371—38 **1 Claim**

1. In a data handling system wherein digital data is stored by writing data on storage media, and wherein said data may be subsequently retrieved by reading the data from the storage media, and further wherein, for error detection and correction purposes, the data is encoded with a Reed-Solomon code prior to writing it on the media and decoded after it is read from the media, a method of sharing encoding and decoding circuitry between the writing-encoding and reading-decoding processes, said method comprising the steps of

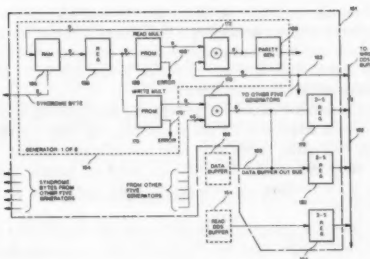
(a) during a write operation:

(1) selecting with a select means a select input data byte to be a first data byte recorded on the media at a prescribed location, and processing this data byte through an exclusive-or means to produce a sum and storing the sum in a storage means;

(2) selecting the select input data byte to be a second data byte recorded on the media, said second data byte being of the same degree as the first data byte, and processing this second data byte through said exclusive-or means and storing the sum in said storage means, which sum comprises a component derived from the product of the data byte previously held in said storage means and the prescribed data of a first multiplication means;

(3) repeating step (2) for each data byte of the same degree as the first data byte for as many data bytes of that degree as are recorded on the media for a given block of data;

(4) selecting the select input data byte to be the combined data byte generated by a data byte combination means,



and, after processing the same through said exclusive-or means and storing the sum in said storage means, recording said combined data byte on the media as an ECC byte that is appended to the data within said block of data previously recorded on the media; and

(b) during a read operation:

(1) selecting with said select means the select input data byte to be a first data byte read from the media at the prescribed location, and processing this data byte through said exclusive-or means and storing the sum in said storage means;

(2) selecting the select input data byte to be a second data byte read from the media having the same degree as the first data byte, and processing this second data byte through said exclusive-or means and storing the sum in said storage means, which sum comprises a component derived from the product of the data byte previously held in said storage means and the prescribed data of said first multiplication means;

(3) repeating step (2) for each data byte of the same degree that is read from the media until all such bytes within the given block of data has been read; and

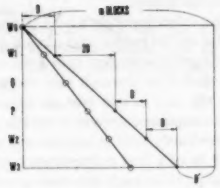
(4) using the byte finally held in said storage means as a syndrome byte to help correct the errors that have occurred as the reading-decoding process continues.

4,562,578

METHOD FOR DATA TRANSMISSION

Kentaro Odaka, Kanagawa; Yoichiro Sako; Yuichi Kojima, both of Tokyo; Kenji Nakano, and Hisayoshi Moriwaki, both of Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 13, 1983, Ser. No. 494,325
Claims priority, application Japan, May 15, 1982, 57-82660
Int. Cl.⁴ G06F *11/10*
U.S. Cl. 371—40 **23 Claims**



1. Apparatus for providing an error correcting code for a digital data signal to be transmitted, said digital data signal being formed of a plurality of blocks, said apparatus comprising:

random access memory means into which said digital data signal is selectively written;

a parity code generator connected to said random access memory means receiving said digital data contained therein for generating two parity series therefrom forming error correction codes and for arranging a first parity series at the center of block and a second parity series at one end of the block, said digital data and parity series being fed back to said random access memory means;

address generator means for generating interleaving addresses and block addresses for use in reading out said digital data signal and parity series in an interleaved state, said interleaving addresses being fed to said random access memory means for reading out said digital data signal and said two parity series;

signal summing means connected to sum the digital data signal and parity series read out from said random access memory means in accordance with said interleaving addresses with said block addresses from said address generator means and producing a serial summed signal therefrom; and

modulation encoder means connected to modulate said serial summed signal from said signal summing means and producing a modulated digital data signal to be transmitted including an error correcting code.

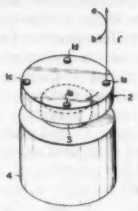
4,562,579

LIGHT BEAM MODULATING AND DEFLECTING SYSTEM

Shigeo Harada, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Asaka, Japan

Filed Oct. 20, 1982, Ser. No. 435,505
Claims priority, application Japan, Oct. 23, 1981, 56-169600
Int. Cl.⁴ H01S *3/10*
U.S. Cl. 372—26 **10 Claims**

1. A signal transmission system comprising a stationary electrode secured to a stationary supporting body, and a rotatable electrode secured to a rotating body and a semiconductor type light source mounted on said rotating body and electrically coupled to said rotatable electrode, said rotatable electrode being opposed in a slightly spaced relation to said stationary electrode to form a capacitor, means for modulating a high frequency electrical signal and applying the modulated signal to said stationary electrode, said modulated signal resulting from the modulation of said high frequency signal with a and light information signal means for driving and controlling said semiconductor light source being located between said rotatable electrode and said semiconductor source, whereby the carrying the light information is transmitted from said stationary



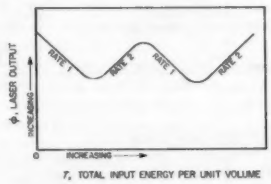
electrode on said supporting body side to said rotatable electrode on said rotating body side.

4,562,580

PHOTOLYTIC IMPROVEMENT OF DYE LASER LIFETIMES

Aaron N. Fletcher, Ridgecrest, and Richard H. Knipe, Los Osos, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 27, 1984, Ser. No. 635,316
Int. Cl.⁴ H01S *3/09*
U.S. Cl. 372—69 **4 Claims**



1. A method for photolytically extending the lifetime and output of dye lasers in a laser system comprising the steps of:

placing a dye solution comprising a coumarin laser dye and a solvent into a dye laser cavity;

screening said system from ultraviolet light with a pyrex filter;

covering said dye solution with an inert gas; and

increasing the rate of photolysis with a flashlamp which emits at a specific excitation wavelength that will photolyze products absorbing at the lasing wavelength and not photolyze that dye it self thereby increasing the energy input into said dye solution such that an increased output and dye lifetime are obtained.

4,562,581

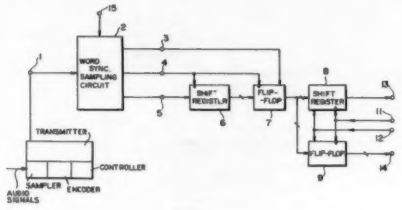
DIGITAL SIGNAL TRANSMITTING AND RECEIVING SYSTEM FOR SERIAL DATA WHICH CAN BE EASILY DECODED

Masato Tanaka, Tokyo; Tadashi Ohtsuki, Kanagawa, and Yoshikazu Tsuchiya, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 378,408, May 14, 1982, abandoned, which is a continuation of Ser. No. 179,027, Aug. 18, 1980, abandoned. This application May 17, 1984, Ser. No. 610,944
Claims priority, application Japan, Aug. 20, 1979, 54-105769
Int. Cl.⁴ H04L *7/04*
U.S. Cl. 375—7 **15 Claims**

1. Apparatus for transmitting and receiving binary data in pulse-code-modulation of audio signals which are sampled at a sampling frequency higher than audio frequency and are encoded to form data words of a number of data bits and a number of control or user bits each within the time period T and

including one or more word sync pulses of which at least one pulse has a time period of 0.5nT where "n" is an integer other than two comprising transmitting means for encoding and transmitting said data words, means receiving said data words from said transmitting means and comprising a word sync sampling circuit which receives said incoming data words and a high frequency clock signal input which has a frequency high enough to discriminate each time period 0.5nT and reproducing the word sync signal in data (WSD), a bit clock signal, and



serial data signals, a first shift register receiving said bit clock signals and said serial data signals from said word sync sampling circuit and converting the data from serial to parallel form, a first flip-flop circuit receiving said parallel data from said first shift register and said word sync signal in data (WSD) and said bit clock signals from said word sync sampling circuit, a decoding means receiving the parallel data from said first flip-flop and receiving receiver generated clock signals and said decoding means producing output serial data words synchronized with said generator clock signals.

4,562,582

BURST SIGNAL RECEIVING APPARATUS

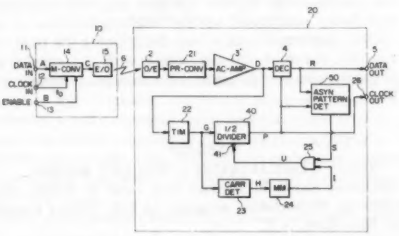
Nobuyuki Tokura; Yoshiro Hakamata, both of Yokosuka, and Kimio Oguchi, Yokohama, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Apr. 9, 1984, Ser. No. 597,867

Claims priority, application Japan, Apr. 18, 1983, 58-68035; Feb. 24, 1984, 59-34816

Int. Cl.[4] H04B *9/00, 1/62*

U.S. Cl. 375—87 **30 Claims**



1. Apparatus for receiving a burst signal intensity-modulated by a signal obtained by Manchester-code converting each code of an input signal into a pair of codes, comprising:

a partial response circuit for converting the received burst signal into an AC signal by a partial response conversion;

an AC-coupling amplifier connected to the output side of the partial response circuit, for amplifying the AC signal;

clock-generating means for generating, from the received burst signal, a clock signal corresponding to the timing of a latter one of the Manchester-coded pair codes; and

a binary decision circuit connected to the output ends of the clock generating means and the AC-coupling amplifier, for deciding the output of the AC-coupling amplifier at the timing of the clock signal to provide a binary output.

4,562,583

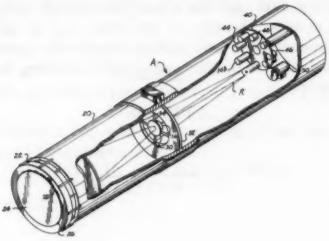
SPECTRAL SLICING X-RAY TELESCOPE WITH VARIABLE MAGNIFICATION

Richard B. Hoover, and Ernest Hildner, both of Huntsville, Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 17, 1984, Ser. No. 571,613

Int. Cl.[4] G21K *7/00*

U.S. Cl. 378—43 **8 Claims**



1. A telescope adapted to receive x-ray and extreme ultraviolet radiation beams, said telescope comprising:

a telescope housing, with a front opening for transmitting radiation,

at least one front stop connected to said front opening of said telescope housing to prevent unwanted incoming radiation from interfering with the desired operation of the telescope,

a glancing incidence primary optical system comprised of at least one mirror at the front entrance of the telescope for reflecting incoming radiation toward a principle focus on the primary optical axis,

a plurality of secondary mirrors in front of the primary focal point along the primary optical axis,

a high sensitivity x-ray and extreme ultraviolet light detector located at the secondary focal point along the primary optical axis,

a mounting means for holding said secondary mirrors, and

a selection means for choosing the appropriate secondary mirror.

4,562,584

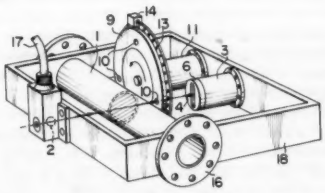
APPARATUS FOR MEASURING VOID RATIOS BY USING RADIATION

Tadashi Narabayashi, Ichikawa, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Dec. 1, 1982, Ser. No. 446,052

Int. Cl.[4] G01B *15/02*

U.S. Cl. 378—54 **2 Claims**



1. In apparatus for measuring a void ratio by using X-Ray radiation of the type comprising a hollow measuring unit through which fluid containing voids flows, a source of X-ray

radiation and a radiation detector disposed on opposite sides of said measuring unit, the improvement which comprises an X-ray opaque rotary disc disposed between said measuring unit and said radiation detector and said disc having a first plurality of openings which are relatively small circular measuring openings substantially equal to the size of the voids to be detected and are equally spaced around a first circular path on said rotary disc for transmitting said radiation to said detector after passing through said hollow measuring unit, said measuring openings forming fine circular radiation beams, means for measuring the rotational angle of the disc comprising a second plurality of openings equally spaced around said disc on a second circular path which is radially spaced from said first circular path; means on one side of the disc for sending an optical signal through the second plurality of opening and an optical detector therefor on the other side of the disc and means connected to said optical detector for measuring the rotational angle of the disc and means for driving the disc at a constant speed.

4,562,585

SEQUENTIAL X-RAY CRYSTAL SPECTROMETER

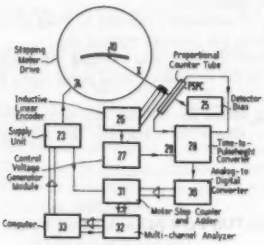
Herbert Göbel, and Rupert Köpl, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 390,993, Jun. 22, 1982. This application Apr. 22, 1985, Ser. No. 724,953

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1981, 3125803

Int. Cl.⁴ G01T *1/36*

U.S. Cl. 378—83 **19 Claims**



1. A sequential x-ray spectrometer for analyzing x-ray radiation from a sample, comprising: a curved analyzer crystal; position-sensitive detector means for measuring x-ray radiation intensity from the sample via the analyzer crystal; means for displacing the position sensitive detector means during analysis; means for rotating the analyzer crystal so as to scan a surface of the sample; means for rotating the position sensitive detector means during analysis; said curved analyzer crystal being a focusing crystal for focusing the radiation on the detector means; said displacing means displacing the detector means so that a given point of the detector means remains on a focusing circle where the x-ray radiation is focused by the focusing crystal; and the detector means rotating means rotating the detector means through an angle which is twice as large as an angle through which the analyzer crystal is rotated by its rotating means such that during simultaneous displacement of the detector means on the focusing circle, the given point of the detector means remains at the focus.

4,562,586

X-RAY IMAGE PICK-UP DEVICE

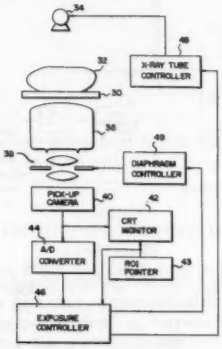
Michitaka Honda, and Osamu Takami, both of Tochigi, Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Filed May 16, 1984, Ser. No. 610,666

Claims priority, application Japan, May 18, 1983, 58-88282

Int. Cl.⁴ H05G *1/44*

U.S. Cl. 378—108 **5 Claims**



1. An X-ray image pick-up device comprising:

an X-ray source for radiating X-rays onto an object including a region of interest;

means for converting to an optical image an X-ray image obtained when the X-rays irradiate the object and are transmitted therethrough;

image pick-up means for converting to an image pick-up signal the optical image which is generated from said converting means;

optical diaphragm means, disposed between said converting means and said image pick-up means, for adjusting an amount of light incident on said image pick-up means; and

exposure control means for detecting a maximum value of image pick-up signals from said image pick-up means and an average value of the image pick-up signals in the region of interest when a single image pick-up operation is performed, calculating density resolutions of output pick-up signals of said image pick-up means with respect to various combinations of tube voltages and tube currents of said X-ray source and optical diaphragm values of said optical diaphragm means, and determining the tube voltage and the tube current, along with the optical diaphragm value which determine a maximum density resolution.

4,562,587

X-RAY TUBE HAVING A ROTARY ANODE

Jan Gerkema; Anton K. Niessen, and Jozef B. Pelzer, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 16, 1983, Ser. No. 562,312

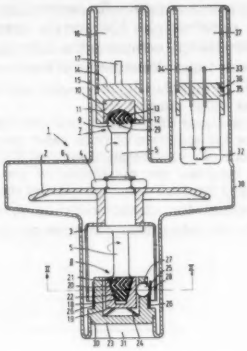
Claims priority, application Netherlands, Oct. 6, 1983, 8303422

Int. Cl.⁴ H01J *35/28*

U.S. Cl. 378—133 **4 Claims**

1. An X-ray tube having a rotary anode which is accommodated in a vacuum-tight housing so as to be rotatable by means of at least one metal-lubricated bearing, in which the bearing is a sliding bearing of which at least the mutually cooperating bearing surfaces consist essentially of Mo or of an Mo-alloy which is not substantially attacked by the lubricant present in the sliding bearing, which lubricant consists essentially of Ga or a Ga-alloy which comprises at least 50% by weight of Ga and further comprises In and/or Sn, which lubricant effec-

tively wets the bearing surfaces and has a vapour pressure which is smaller than 10^{-4} Pa at 500° C., characterized in that



the lubricant comprises from 1 to 4% by weight of Ag and/or Cu.

4,562,588

POSITIONING DEVICE FOR AN EXTENSION AND REPOSITIONING APPARATUS

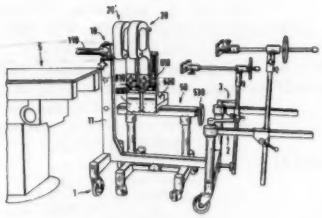
Hermann Ruf, Pfutzenstrasse 58, 6103 Griesheim, Fed. Rep. of Germany

Filed Nov. 12, 1982, Ser. No. 441,042

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1981, 8133813[U]

Int. Cl.⁴ A61B *17/18*

U.S. Cl. 378—208 **15 Claims**



1. A positioning device for orienting an extremity for taking X-rays of the extremity, said device being suitable for use in conjunction with extremity extension and repositioning apparatus, said device comprising a support cradle (**30**) and a connection element (**60, 160**), said support cradle and connection element being formed of a sterilizable, X-ray transparent material:

said support cradle (**30**) having a lower post (**32**) suitable for mounting said cradle on the extension and repositioning apparatus; said support cradle having a generally straight support arm (**36**) projecting horizontally outwardly from said post, the extremity being placed on top of said support arm when being oriented; said support cradle further having a generally straight mounting arm (**34**) adjacent said support arm extending vertically upward above said support arm and against which the extremity is placed when being oriented, said support arm and said mounting arm lying at an angle of approximately 90° to each other, said mounting arm being laterally displaced from said lower post (**32**) in the direction of projection of said support arm; each of said support arm and mounting arm having a free end, said free ends of said support and mounting arms containing means for coupling said support cradle to said connection element;

said connection element (**60, 160**) being formed as an elongated, inflexible, bent element to extend between said horizontal support arm and said vertical mounting arm, said connection element having coupling means on the ends thereof complementary to the coupling means of said support cradle for coupling said connection element to said support cradle; said support cradle and connection element, when coupled, forming a closed member suitable for surrounding the extremity placed on said support arm; and

said coupling means on said support cradle and connection element being joined by removable pins for releasing one or both ends of said connection element from said support cradle.

4,562,589

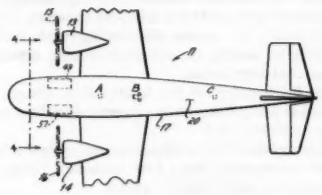
ACTIVE ATTENUATION OF NOISE IN A CLOSED STRUCTURE

Glenn E. Warnaka, and John M. Zalas, both of Erie, Pa., assignors to Lord Corporation, Erie, Pa.

Filed Dec. 15, 1982, Ser. No. 449,851

Int. Cl.⁴ C10K *11/16*

U.S. Cl. 381—71 **9 Claims**



1. A system for the attenuation of sound waves produced in a closed structure having walls, an exterior surface and an interior by a source of sound waves exterior to said closed structure, comprising:

input sensing means disposed adjacent said exterior source of sound waves, said sensing means being operable to produce electrical signals representing the amplitude and phase characteristics of said exterior sound waves, said exterior sound waves impinging against said exterior surface of said closed structure in a pattern and inducing vibration of said walls to produce sound waves in the interior of said body;

cancelling means for generating cancelling sound waves of corresponding amplitude and 180° out-of-phase with said exterior sound waves;

waveguide means disposed in the interior of said closed structure immediately adjacent said wall of said closed structure in the area of impingement of said exterior sound waves, and being spaced from said sensing means, said waveguide means being connected to said cancelling means to provide a path for the propagation of said cancelling sound waves to said closed structure wall for combination with said exterior sound waves;

error sensing means disposed within said interior of said closed structure and being spaced from said waveguide means, said error sensing means being operable to produce electrical signals representing the amplitude and phase characteristics of said combination of said exterior sound waves and cancelling sound waves at said closed structure wall; and

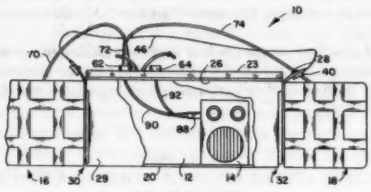
electronic controller means connected with said input sensing means, cancelling means and error sensing means, said electronic controller means being operable to process said electrical signals from said input sensing means, produce outputs for driving said cancelling means to produce said cancelling sound waves, and to adjust said outputs based on said electrical signals from said error sensing means for the production of revised outputs for driving said cancelling means.

4,562,590

WATER-RESISTANT DEVICE FOR PROTECTING AN ELECTRONIC SOUND PRODUCING APPARATUS AND LOUDSPEAKER SYSTEM

Frank DeLage, 4108 Ohio Ave., Tampa, Fla. 33616

Filed Feb. 22, 1984, Ser. No. 582,389
Int. Cl.[4] H04K 1/02
U.S. Cl. 381—90 **19 Claims**



1. A water resistant device for protecting an electronic sound producing apparatus and loudspeaker system from the deleterious effect of water, said device comprising in combination:

a container means for containing the sound producing apparatus, said container means further including:

an external layer of shock resistant material;

a removable lid means cooperating with said container means for sealing the sound producing apparatus within said container means;

a first loudspeaker of the loudspeaker system, said loudspeaker being electrically connected to the sound producing apparatus; and

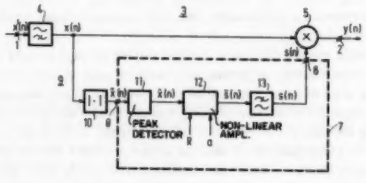
a water resistant first loudspeaker enclosure for housing said first loudspeaker, said first enclosure being removably secured to said container means.

4,562,591

DIGITAL DYNAMIC RANGE CONVERTER

Eduard F. Stikvoort, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 2, 1984, Ser. No. 576,588
Claims priority, application Netherlands, Feb. 8, 1983, 8300468
Int. Cl.[4] H03G 7/00
U.S. Cl. 381—106 **16 Claims**



1. A digital dynamic range converter of the forward control type for varying the dynamic range of an audio signal which is available in digital form and is constituted by a sequence of audio signal samples x(n), and wherein the following processing operations are carried out:

(i) the conversion of the sequence of audio signal samples $\bar{x}(n)$ into a sequence of unipolar signal samples x(n);

(ii) the conversion of the sequence of unipolar signal samples $\bar{x}(n)$ into a sequence of control signal samples s(n);

(iii) the multiplication of each audio signal sample x(n) by an associated control signal sample s(n) for producing a sequence of output samples y(n) which represent a version of the sequence of audio signal samples x(n) varied in dynamic range,

characterized in that

(a) the converter is provided with means for receiving adjustment quantities;

(b) the processing operation for converting the sequence of unipolar signal samples $\bar{x}(n)$ into the sequence of control signal samples s(n) comprises the following steps:

(bi) a peak-value detection step for converting the sequence of unipolar signal samples $\bar{x}(n)$ into a sequence of peak value samples $\hat{x}(n)$;

(bii) a non-linear amplitude transformation step for converting the sequence of peak value samples $\hat{x}(n)$ into a sequence of transformation samples $\bar{s}(n)$,

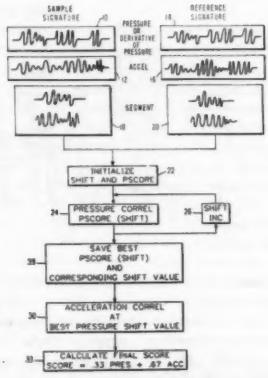
the relation between the magnitude of the transformation samples $\bar{s}(n)$ and the peak value samples $\hat{x}(n)$ being given by an amplitude transmission characteristic curve whose shape is determined by the adjustment quantities received.

4,562,592

SHIFTING TECHNIQUE FOR SIGNATURE VERIFICATION

Timothy J. Chainer, Mahopac, and Thomas K. Worthington, South Salem, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1983, Ser. No. 567,201
Int. Cl.[4] G06K 9/22
U.S. Cl. 382—3 **3 Claims**



1. In a signature verification process including the steps of obtaining acceleration data and pressure data related to a given signature and comparing said data with reference data previously obtained from an identified signer, the improvement which comprises a method of enhancing the correlation or representative segments of the acceleration data which includes the steps of

performing correlations of respective segments of a reference pressure signal and a sample pressure signal by successively measuring the correlation as the two signals are shifted with respect to one another,

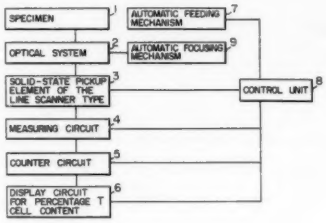
storing the shift values which produce the maximum correlation between each pair of pressure signal segments, and

using the stored shift values as the amount of shift of be utilized during subsequent correlations of respective pairs of the acceleration data.

4,562,593
METHOD FOR DETERMINATION OF PERCENTAGE T CELL CONTENT OF LYMPHOCYTE

Akihiko Ooe, Komaki, and Masaki Fuse, Nagoya, both of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Mar. 1, 1983, Ser. No. 470,945
Claims priority, application Japan, Mar. 8, 1982, 57-36250
Int. Cl.⁴ G06K *9/00*
U.S. Cl. 382—6 **10 Claims**

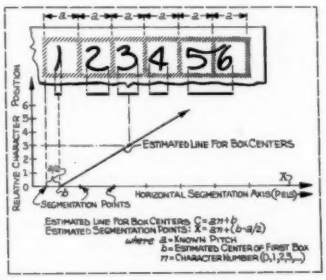


1. A fully automatic method for determining the percentage T-cell content of lymphocytes which have been sampled wherein said lymphocytes comprise T-cells, B-cells and Null-cells, said method comprising scanning a test specimen with a pick up device to produce image signals, discriminating a lymphocyte from other cells contained in said specimen from the output level and regional information of the image signals, searching the data marginal to those of the cells discriminated as a lymphocyte to detect pixels corresponding to the image signal output level different from that corresponding to the lymphocytes or background, discriminating a T-cell from other lymphocytes from the number of detected pixels, and determining and displaying the percentage T-cell content of said lymphocytes.

4,562,594
METHOD AND APPARATUS FOR SEGMENTING CHARACTER IMAGES

Gregory M. Bednar, Matthews, and George B. Fryer, Charlotte, both of N.C., assignors to International Business Machines Corp. (IBM), Armonk, N.Y.

Filed Sep. 29, 1983, Ser. No. 537,280
Int. Cl.⁴ G06K *9/34*
U.S. Cl. 382—9 **15 Claims**


1 2 3 4 5 6
RELATIVE CHARACTER POSITION
ESTIMATED LINE FOR BOX CENTERS
SEGMENTATION POINTS
HORIZONTAL SEGMENTATION AXIS (PELS)
ESTIMATED LINE FOR BOX CENTERS: C = aY + b
ESTIMATED SEGMENTATION POINTS: X = aY + (b - a/2)
where a = KNOWN PITCH
b = ESTIMATED CENTER OF FIRST BOX
Y = CHARACTER NUMBER (1, 2, 3, ...)

1. A method of segmenting character images in an optical system where the character images have a predetermined pitch and the optical image system generates character information comprising a series of scan lines of data, the method comprising:

generating from the scan lines of data profile segments of the character images being scanned, each profile segment being parallel to the direction of reading and representing the size of a scanned character image in the direction of reading;

selecting a generated profile segment that meets certain predetermined size criteria;

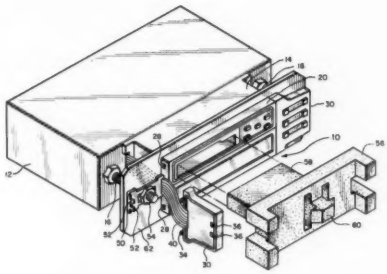
locating the center of the selected profile segment; and

establishing segmentation points between character imaged by generating a linear function dependent upon the predetermined character image pitch and the located center of the selected profile segment, whereby the segmentation points for the character images are integer multiples of the pitch.

4,562,595
FRONT PANEL FOR ELECTRONIC DEVICE SUCH AS AN AUTOMOTIVE RADIO AND METHOD FOR INSTALLING SAME

Martin W. Bauer, Elmhurst; Carl J. Thys, Chicago; Peter A. Fredriksen, Prospect Hts.; David J. Robin, Elmhurst, and Richard J. Schaar, Northbrook, all of Ill., assignors to International Jensen Incorporated, Schiller Park, Ill.

Filed Jan. 6, 1984, Ser. No. 568,735
Int. Cl.⁴ H04B *1/08*
U.S. Cl. 455—345 **9 Claims**



1. A front panel for a radio having left and right front mounting brackets, said front panel comprising:

a central control panel having a first plurality of control switches electrically connected to the radio;

a left side control panel having a second plurality of control switches;

a right side control panel having a third plurality of control switches;

left conductor means for interconnecting the second plurality of control switches with the radio;

right conductor means for interconnecting the third plurality of control switches with the radio; and

means for releasably mounting the left and right side control panels over the left and right front mounting brackets on respective sides of the central control panel to mask the mounting brackets such that the left and right side control panels can be mounted over the respective mounting brackets after the radio has been mounted in place to a mounting panel.

DESIGN PATENTS

GRANTED DEC. 31, 1985

ERRATA

For CLASS	See PATENT NO.
D22–003	281,957
D06–309	282,014

DESIGNS

DECEMBER 31, 1985

281,924
BRASSIERE
Jeanne M. Martini, Brooklyn, N.Y., assignor to Bali Company, Winston-Salem, N.C.
Filed Oct. 13, 1983, Ser. No. 541,791
Term of patent 14 years
U.S. Cl. D2—24

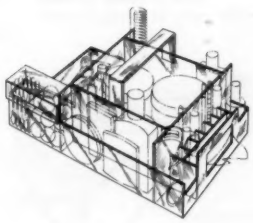
281,925
BOOT WITH TONGUE POCKET
Robert J. Gamm, St. Louis County, Mo., assignor to Kanagroos U.S.A., Inc., St. Louis, Mo.
Filed Jun. 1, 1983, Ser. No. 500,170
Term of patent 14 years
U.S. Cl. D2—275

281,926
ATHLETIC SHOE
I. David Hill, Grand Rapids, Mich., assignor to Wolverine Worl' Wide, Inc., Rockford, Mich.
Filed Jun. 24, 1983, Ser. No. 507,477
Term of patent 14 years
U.S. Cl. D2—310

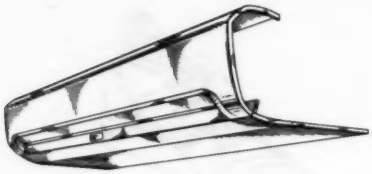
281,927
ATHLETIC SHOE
I. David Hill, Grand Rapids, Mich., assignor to Wolverine World Wide, Inc., Rockford, Mich.
Filed Aug. 10, 1983, Ser. No. 521,692
Term of patent 14 years
U.S. Cl. D2—310

281,928
WE'RE NUMBER 1 CHEERING ORNAMENT OR SIMILAR DEVICE
Terry E. Ostermiller, 1710 Davis Ave., Gering, Nebr. 69341
Filed Apr. 28, 1983, Ser. No. 471,989
Term of patent 14 years
U.S. Cl. D3—5

281,929
COMPARTMENTED CARRYING TRAY FOR COSMETICS OR THE LIKE
Lucille C. Strobel, and Gerald E. Strobel, both of 8305 Sprague Pl., New Carrollton, Md. 20784
Filed Jul. 13, 1983, Ser. No. 513,449
Term of patent 14 years
U.S. Cl. D3—39

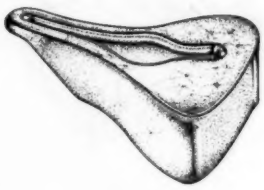


281,930
VEHICLE OVERHEAD STOWAGE BIN UNIT OR THE LIKE
George J. Engfer, Redmond; Anthony I. C. Kirk, Issaquah, and Richard T. Ostlund, Bellevue, all of Wash., assignors to The Boeing Company, Seattle, Wash.
Filed Sep. 29, 1982, Ser. No. 426,494
Term of patent 14 years
U.S. Cl. D3—40



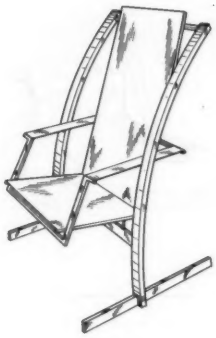
281,931
COMBINED TIE AND BELT HANGER
William D. Arnold, and Paul F. Bertram, both of St. Louis, Mo., assignors to Lee-Rowan Company, St. Louis, Mo.
Filed Aug. 19, 1983, Ser. No. 524,762
Term of patent 14 years
U.S. Cl. D6—317

281,932
BICYCLE SEAT
Helen M. Schneider, 121 E. Walnut St., Cleona, Pa. 17042
Filed Aug. 25, 1983, Ser. No. 526,499
Term of patent 14 years
U.S. Cl. D6—354

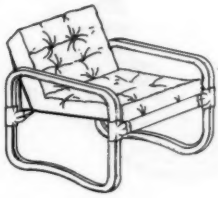


281,933
ARM CHAIR
Didier Deconinck, Seyssins, France, assignor to Allibert S.A., Grenoble, France
Filed Jul. 7, 1983, Ser. No. 511,712
Term of patent 14 years
U.S. Cl. D6—368

281,934
CHAIR
Michael Braun, 88-04 63rd Dr., Rego Park, N.Y. 11374
Filed Jun. 10, 1983, Ser. No. 503,277
Term of patent 14 years
U.S. Cl. D6—371



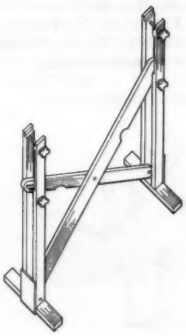
281,935
CHAIR
Bernie Lowsky, 1229 SW. 87th Ter., Plantation, Fla. 33324
Filed Dec. 1, 1983, Ser. No. 557,058
Term of patent 14 years
U.S. Cl. D6—373



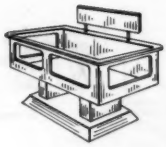
281,936
BOAT CHAIR
Bernard J. Kennedy, Maplewood, Minn., assignor to Kennedy Houseboats, Inc., Miller, S. Dak.
Filed Jun. 30, 1983, Ser. No. 509,351
Term of patent 14 years
U.S. Cl. D6—380

281,937
LAP MOUNTED ADJUSTABLE TRAY
Edward L. Roczey, 1740 Hillsdale La., El Cajon, Calif. 92021
Filed Jun. 10, 1983, Ser. No. 503,258
Term of patent 14 years
U.S. Cl. D6—406

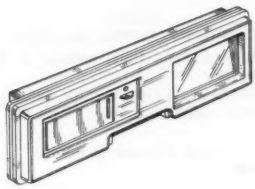
281,938
SKI WAXING BENCH
James E. Vincent, 221 S. Midvale Blvd., Madison, Wis. 53705, and Rex Rylander, 2725 Canter Ave., Madison, Wis. 53704
Filed Feb. 12, 1982, Ser. No. 348,417
Term of patent 14 years
U.S. Cl. D6—429



281,939
TUB DISPLAY STAND
James M. Hug, Farmington Hills, Mich., assignor to Novi Products Company, Novi, Mich.
Filed Jun. 6, 1983, Ser. No. 501,529
Term of patent 14 years
U.S. Cl. D6—449

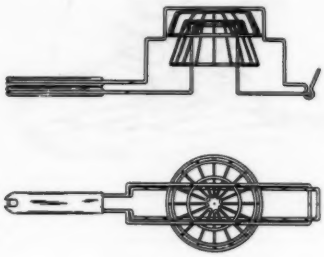


281,940
AIRLINE PASSENGER SEAT BACK COMBINED LCD DISPLAY AND BATTERY PACK UNIT FOR AN ENTERTAINMENT AND INFORMATION SYSTEM
Arnold R. Steventon, 25617 Bellerive Dr., Valencia, Calif. 91355, and Robert F. Butler, 18155 Medley Dr., Encino, Calif. 91436
Filed Oct. 3, 1983, Ser. No. 538,163
Term of patent 14 years
U.S. Cl. D6—492

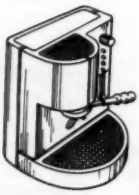


281,941
COMBINED SEAT AND BACK UNIT
Emilio Ambasz, New York, N.Y., and Giancarlo Piretti, Bologna, Italy, assignors to Center for Design Research and Development N.V., Curacao, Netherlands Antilles
Filed Apr. 15, 1983, Ser. No. 485,273
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1982, 1190/82
Term of patent 14 years
U.S. Cl. D6—502

281,942
HINGED TORTILLA BASKET FRYER
Wade A. Bentson, San Francisco, Calif., assignor to Amco Corporation, Chicago, Ill.
Filed Nov. 18, 1983, Ser. No. 553,372
Term of patent 14 years
U.S. Cl. D7—43

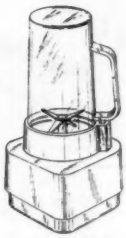


281,943
ESPRESSO COFFEE MACHINE
Visconti Rosalgino, Cerano, Italy, assignor to Nuova Faema S.p.A., Milan, Italy
Filed May 17, 1983, Ser. No. 495,252
Claims priority, application Italy, Nov. 25, 1982, 23541 B/82[U]
Term of patent 14 years
U.S. Cl. D7—309



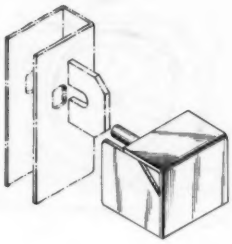
281,944
GAS BARBECUE
Ming K. Chan, 1st Flr., 58 Hung To Rd., Kowloon;, Hong Kong
Filed Mar. 4, 1983, Ser. No. 472,090
Claims priority, application United Kingdom, Sep. 15, 1982, 821008726
Term of patent 14 years
U.S. Cl. D7—332

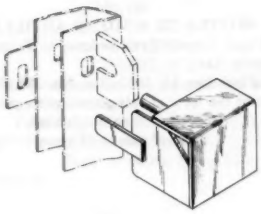
281,945
PORTABLE BLENDER
Raymond D. Boyce, P. O. Box 1822 Brookhaven Blvd., Norman, Okla. 73069
Filed Jan. 17, 1983, Ser. No. 458,576
Term of patent 14 years
U.S. Cl. D7—378



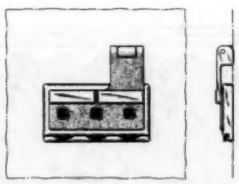
281,946
CORKSCREW
Gerald Youhanaie, 948 E. Redfield Rd., Tempe, Ariz. 85283
Filed Jun. 13, 1983, Ser. No. 503,886
Term of patent 14 years
U.S. Cl. D8—38

281,947
LATCH FOR ROLLING GATES
Vincent Greco, 195 Huntington Ave., Bronx, N.Y. 10465
Filed May 13, 1983, Ser. No. 494,521
Term of patent 14 years
U.S. Cl. D8—331

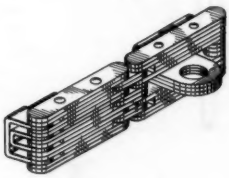




281,948
COMBINATION LOCK FOR LUGGAGE OR SIMILAR ARTICLES
Klaus Hesse, Sundern-Amecke, Fed. Rep. of Germany, assignor to Sudhaus Schloss-und Beschlagtechnik GmbH & Co., Iserlohn, Fed. Rep. of Germany
Filed Feb. 11, 1983, Ser. No. 465,997
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1982, 12AR291/82MR7254
Term of patent 14 years
U.S. Cl. D8—338

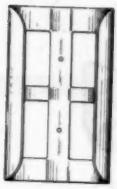


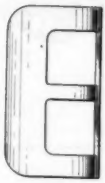
281,949
HASP
Udo Hartmann, Mequon; Mark W. Stoller, Milwaukee, and Kenneth N. Grandy, South Milwaukee, all of Wis., assignors to Master Lock Company, Milwaukee, Wis.
Filed Aug. 11, 1983, Ser. No. 522,475
Term of patent 14 years
U.S. Cl. D8—345



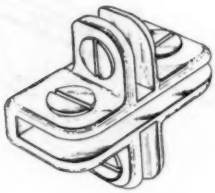
281,950
HOOK
Isaac Sachs, 1240 Ridgewood Dr., Chomedey, Laval, Quebec, Canada (H7W 1L3)
Filed Jun. 7, 1983, Ser. No. 501,894
Term of patent 14 years
U.S. Cl. D8—370

281,951
TANK HOLDER
Michael H. LaMeyer, 251 Lake Arbor Dr., Palm Springs, Fla. 33461, and Dale B. Finfrock, Jr., P.O. Box 2643, 123 Australian Ave., Palm Beach, Fla. 33480
Filed Oct. 31, 1983, Ser. No. 547,206
Term of patent 14 years
U.S. Cl. D8—373

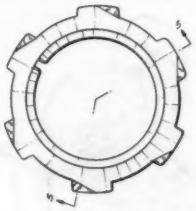




281,952
SHEET GLASS CONNECTOR
Gary L. Farmer, Downey, and Donald E. Leuder, Long Beach, both of Calif., assignors to Cal-Tuf Glass Corporation, South Gate, Calif.
Filed Dec. 13, 1983, Ser. No. 560,961
Term of patent 14 years
U.S. Cl. D8—394

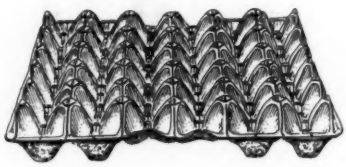


281,953
NUT
Edward J. Newman, Pelham, N.Y., assignor to Coats & Clark, Inc., Stamford, Conn.
Filed Feb. 11, 1982, Ser. No. 347,926
Term of patent 14 years
U.S. Cl. D8—397

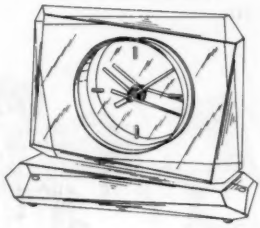


281,954
BOTTLE OR SIMILAR ARTICLE
Norwin H. Vogel, Seguin, Tex., assignor to Texas NRG Corporation, Seguin, Tex.
Filed Jun. 14, 1982, Ser. No. 388,188
The portion of the term of this patent subsequent to Jul. 27, 1996, has been disclaimed.
Term of patent 14 years
U.S. Cl. D9—322

281,955
EGG TRAY
Bent Moller, Tonder, Denmark, assignor to Brodrene Hartmann A/S, Lyngby, Denmark
Filed Sep. 3, 1982, Ser. No. 414,775
Claims priority, application Denmark, Mar. 4, 1982, 189/82
Term of patent 14 years
U.S. Cl. D9—341

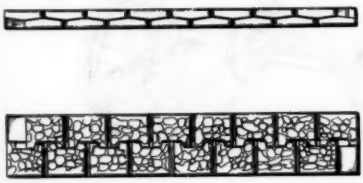


281,956
CLOCK
James R. Nicolino, 971 Braxton St., Uniondale, N.Y. 11553, and Harry R. Nicolino, 1059 Rottkamp St., Valley Stream, N.Y. 11580
Filed Aug. 5, 1983, Ser. No. 520,560
Term of patent 14 years
U.S. Cl. D10—26



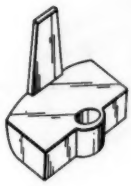
281,957
NECKLACE
Marina Bulgari, Athens, Greece, assignor to Marina B. Creation S.A., Vaduz, Liechtenstein
Filed Aug. 15, 1983, Ser. No. 523,069
Claims priority, application Italy, Feb. 15, 1983, 35607/83[U]
Term of patent 14 years
U.S. Cl. D11—3

281,958
JEWELRY CHAIN
Masao Otake, Ichikawa, Japan, assignor to Nakagawa Corporation, Tokyo, Japan
Filed Jun. 10, 1983, Ser. No. 503,339
Claims priority, application Japan, May 31, 1983, 58-23165
Term of patent 14 years
U.S. Cl. D11—12

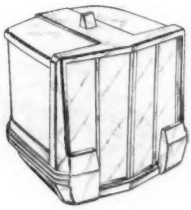


281,959
PENDANT
Arturo Balbuena, P.O. Box 7701, Woodlands, Tex. 77387
Filed Jul. 25, 1983, Ser. No. 516,740
Term of patent 14 years
U.S. Cl. D11—81

281,960
WATER LEVEL FLOAT FOR USE IN PLANTERS
Arthur R. Carlson, East Malvern, Victoria, Australia
Filed Mar. 4, 1983, Ser. No. 472,154
Term of patent 14 years
U.S. Cl. D11—164



281,961
CABLE CAR CABIN
Roland Roc, Veurey, France, assignor to Etablissements Montaz Mautino, Fontaine, France
Filed May 24, 1983, Ser. No. 498,175
Claims priority, application France, Dec. 2, 1982, 824187
Term of patent 14 years
U.S. Cl. D12—52



281,962

MOTORCYCLE

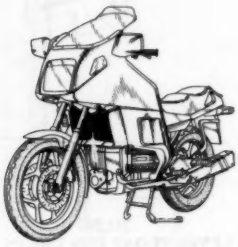
Karl H. Abe, Steinebach/Woerthsee, and Klaus V. Gevert, Munich, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke A.G., Fed. Rep. of Germany

Filed Nov. 9, 1983, Ser. No. 550,130

Claims priority, application Fed. Rep. of Germany, May 9, 1983, MR NO. 13415

Term of patent 14 years

U.S. Cl. D12—110



281,963

MOTOR TRICYCLE

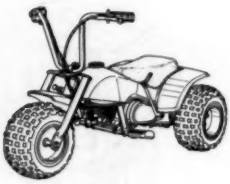
Masahiro Watanabe, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 25, 1983, Ser. No. 479,041

Claims priority, application Japan, Nov. 2, 1982, 57-49844

Term of patent 14 years

U.S. Cl. D12—110



281,964

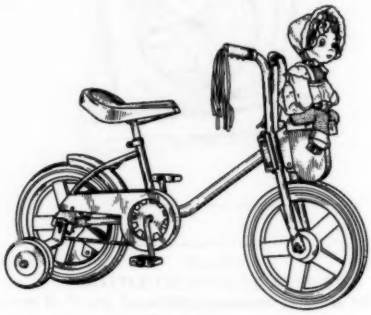
BICYCLE FOR A CHILD WITH A RIDER-SIMULATING DOLL MOUNTED THEREON

Elliot A. Rudell, 2215 W. 237 St., Torrance, Calif. 90501; Michael E. Shumate, Manhattan Beach, Calif., Joseph S. Cernansky, Gardena, Calif., and Richard P. Kamrath, Redonda Beach, Ca. assignors to Elliot A. Rudell, Lawndale, Calif.

Filed May 9, 1983, Ser. No. 493,071

Term of patent 14 years

U.S. Cl. D12—111



281,965

TRICYCLE FOR A CHILD WITH A RIDER-SIMULATING DOLL MOUNTED THEREON

Elliot A. Rudell, 2215 W. 237 St., Torrance, Calif. 90501; Michael E. Shumate, Manhattan Beach, Calif., Joseph S. Cernansky, Gardena, Calif., and Richard P. Kamrath, Redonda Beach, Ca. assignors to Elliot A. Rudell, Lawndale, Calif.

Filed May 9, 1983, Ser. No. 493,072

Term of patent 14 years

U.S. Cl. D12—113

281,966

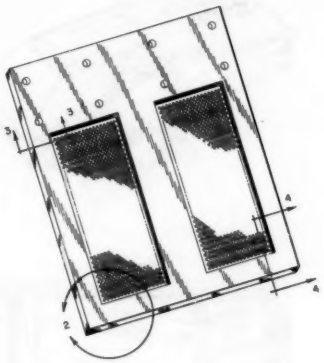
MUD FLAP FOR TRUCKS

James R. Lockwood, Wapakoneta, Ohio, assignor to Lancaster Colony Corporation, Columbus, Ohio

Filed Apr. 19, 1983, Ser. No. 486,402

Term of patent 14 years

U.S. Cl. D12—185



281,967

RIM FOR BICYCLES

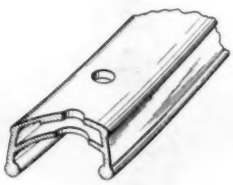
Masaki Hashimoto, c/o Kansai-kohjo of Araya Kogyo Kabushikikaisha 1-1-Takeshima, Nishiyodogawa-ku, Osaka-shi, Osaka-fu, Japan

Filed Dec. 5, 1983, Ser. No. 557,931

Claims priority, application Japan, Sep. 27, 1983, 58-42031

Term of patent 14 years

U.S. Cl. D12—208



281,968

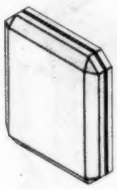
D.C. POWER PACK OR SIMILAR ARTICLE

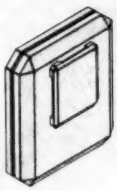
Karl O. Thiele, Bloomfield Hills, and Albert L. Taylor, Orchard Lake, both of Mich., assignors to Enertronics, Inc., Clawson, Mich.

Filed Aug. 12, 1983, Ser. No. 522,830

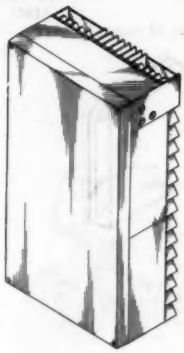
Term of patent 14 years

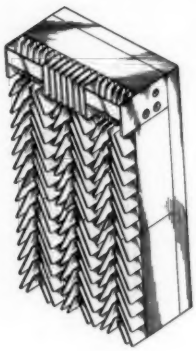
U.S. Cl. D13—4



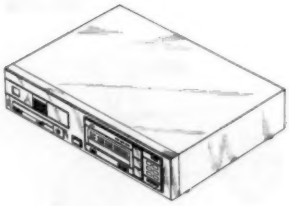


281,969
CASING FOR ELECTRICAL APPARATUS OR THE LIKE
Jorgen J. Moeller, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark
Filed Feb. 4, 1983, Ser. No. 464,055
Term of patent 14 years
U.S. Cl. D13—40

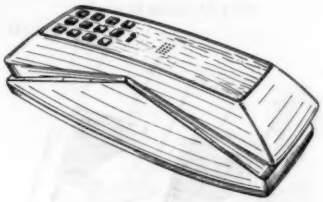


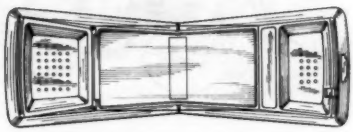


281,970
DIGITAL AUDIO DISC PLAYER
Hirotaka Imai, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed Sep. 29, 1983, Ser. No. 537,239
Claims priority, application Japan, Apr. 8, 1983, 58-14891
Term of patent 14 years
U.S. Cl. D14—1



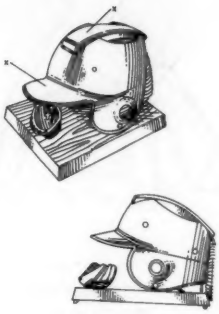
281,971
COMBINED HANDSET TELEPHONE AND INTERLOCKING CRADLE STAND ASSEMBLY
Kenneth Reichenstein, Floral Park, N.Y., assignor to Webcor Electronics, Inc., Garden City, N.Y.
Filed Jul. 25, 1983, Ser. No. 499,288
Term of patent 14 years
U.S. Cl. D14—53



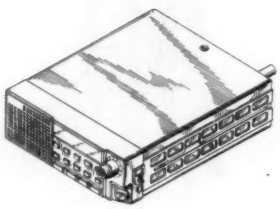


281,972
HANDSET TELEPHONE
Elliot I. Baum, Dix Hills, N.Y., assignor to QT&T, Inc., Brentwood, N.Y.
Filed Apr. 21, 1983, Ser. No. 487,194
Term of patent 14 years
U.S. Cl. D14—53

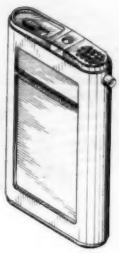
281,973
TELEPHONE
Bernard A. Paul, 788 Greenview Ave., Des Plaines, Ill. 60016
Division of Ser. No. 383,910, Jun. 2, 1982, Pat. No. Des. 277,180. This application Aug. 13, 1984, Ser. No. 639,864
Term of patent 14 years
U.S. Cl. D14—53



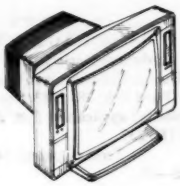
281,974
MOBILE RADIO TRANSCEIVER
Masataka Suzuki, and Hitoshi Masuda, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Aug. 15, 1983, Ser. No. 523,252
Claims priority, application Japan, Feb. 14, 1983, 58-5455
Term of patent 14 years
U.S. Cl. D14—68



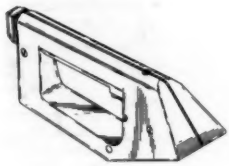
281,975
RADIO RECEIVER
Takashi Oyamada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Sep. 9, 1983, Ser. No. 530,827
Claims priority, application Japan, Mar. 15, 1983, 58-10662
Term of patent 14 years
U.S. Cl. D14—70



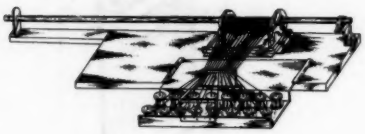
281,976
STEREO TELEVISION RECEIVER
Laurent Menei, 16 Avenue Jean Lurcat, 49240 Arville, France
Filed Nov. 18, 1983, Ser. No. 553,334
Claims priority, application France, Jul. 15, 1983, DM 002692
Term of patent 14 years
U.S. Cl. D14—80



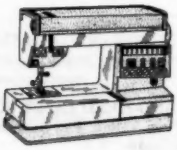
281,977
PORTABLE HAND-HELD LASER SCANNER
William B. Sklaroff, Penn Valley, Pa., assignor to Metrologic Instruments, Inc., Bellmawr, N.J.
Filed Aug. 22, 1983, Ser. No. 525,377
Term of patent 14 years
U.S. Cl. D14—116

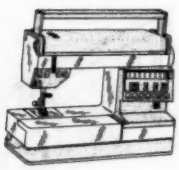


281,978
SMOCKING MACHINE ASSEMBLY
Cynthia M. Parsons, 412 Newman Ave., Huntsville, Ala. 35801, and G. Michael Maples, 2609 University Dr., Huntsville, Ala. 35805
Filed Nov. 8, 1982, Ser. No. 439,792
Term of patent 14 years
U.S. Cl. D15—69

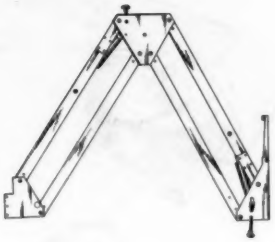


281,979
SEWING MACHINE
Willi Meier, Karlsruhe-Durlach, Fed. Rep. of Germany, assignor to Firma Dorina Nähmaschinen GmbH, Fed. Rep. of Germany
Filed Feb. 28, 1983, Ser. No. 470,514
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1982, MR VIII/237
Term of patent 14 years
U.S. Cl. D15—69

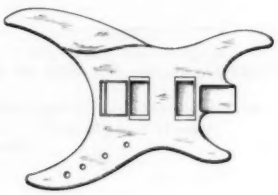




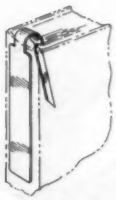
281,980
BALANCE ARM FOR SUPPORTING WORKING TOOLS
Bertil Larsson, Ödsmål, Sweden, assignor to S & L Maskin Aktiebolag, Goteborg-Bohus Lan, Sweden
Filed Dec. 6, 1982, Ser. No. 447,265
Claims priority, application Sweden, Jun. 9, 1982, 82-1512
Term of patent 14 years
U.S. Cl. D15—138



281,981
GUITAR BODY OR SIMILAR ARTICLE
Hartley D. Peavey, 4383 - 18th Ave., Meridian, Miss. 39301
Filed Oct. 7, 1983, Ser. No. 539,984
Term of patent 14 years
U.S. Cl. D17—20

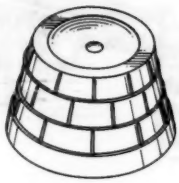


281,982
BOOK MARK
Gisela G. Hammond, 175 E. Delaware Pl., Chicago, Ill. 60611
Filed Nov. 21, 1983, Ser. No. 553,553
Term of patent 14 years
U.S. Cl. D19—34



281,983
COMBINED TERRESTRIAL GLOBE AND CLOCK
Shouji Yasufuku, Gifu, Japan, assignor to Unionelecs Kabushiki Kaisha, Gifu, Japan
Filed Jun. 27, 1983, Ser. No. 508,485
Term of patent 14 years
U.S. Cl. D19—61

281,984
TOY BLOCK
Shinroku Nakao, Kanagawa; Yoshiyasu Ishii, and Yukio Ishige, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Feb. 22, 1983, Ser. No. 468,784
Claims priority, application Japan, Aug. 20, 1982, 57-37742
Term of patent 14 years
U.S. Cl. D21—108



281,985
TOY SLIDE OR SIMILAR ARTICLE
John W. Spirk, Jr., 50 Stonewood Dr., and John R. Nottingham, 60 Stonewood Dr., both of Moreland Hills, Ohio 44022
Filed Sep. 6, 1983, Ser. No. 529,392
Term of patent 14 years
U.S. Cl. D21—109

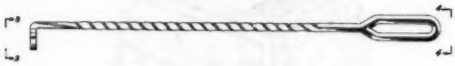
281,986
TOY PLAY HOUSE OR SIMILAR ARTICLE
John R. Nottingham, 60 Stonewood Dr., and John W. Spirk, Jr., 50 Stonewood Dr., both of Moreland Hills, Ohio 44022
Filed Sep. 12, 1983, Ser. No. 531,078
Term of patent 14 years
U.S. Cl. D21—114

281,987
TOY BUS
Pietro Catelli, Como, Italy, assignor to Artsana S.p.A., Italy
Filed Jul. 28, 1983, Ser. No. 518,152
Term of patent 14 years
U.S. Cl. D21—140

281,988
DOLL
Robert C. Williams, 2915 Shasta St., Redding, Calif. 96001
Filed May 6, 1983, Ser. No. 492,470
Term of patent 14 years
U.S. Cl. D21—184

281,989
NOVELTY DOLL
Laraine Pipoly, 4717 Blackstone Ave., Long Beach, Calif. 90808
Filed Oct. 13, 1983, Ser. No. 519,965
Term of patent 14 years
U.S. Cl. D21—190

281,990
PUSH STICK FOR A HOOP
Thayard A. McGuire, 8617 Parkway Cir., Riverview, Fla. 33569
Filed May 19, 1983, Ser. No. 496,123
Term of patent 14 years
U.S. Cl. D21—210



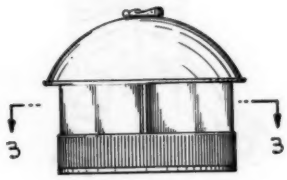
281,991
GOLF CLUB GRIP
Karsten Solheim, 501 W. Wakonda La., Phoenix, Ariz. 85023
Filed Sep. 1, 1983, Ser. No. 528,414
Term of patent 14 years
U.S. Cl. D21—222

281,992
CHILDREN'S CLIMBER AND SWING SUPPORT
D. Scott Saxman, and William H. Ziegler, Jr., both of Bedford, Pa., assignors to Brown Group Recreational Products, Inc., Bedford, Pa.
Filed Nov. 25, 1983, Ser. No. 555,293
Term of patent 14 years
U.S. Cl. D21—245

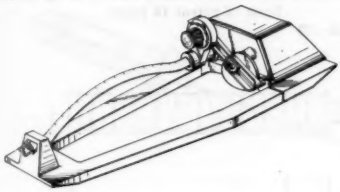
281,993
PISTOL MACHINE GUN OR THE LIKE
Vito Cellini, 3115 Old Ranch Rd., San Antonio, Tex. 78217
Filed Apr. 25, 1983, Ser. No. 460,478
Term of patent 14 years
U.S. Cl. D22—6

281,994
Patent Not Issued For This Number

281,995
FLY TRAP
Alvin D. Schmidt, Reinholds, Pa., assignor to Woodstream Corporation, Lititz, Pa.
Filed Sep. 9, 1983, Ser. No. 530,758
Term of patent 14 years
U.S. Cl. D22—19

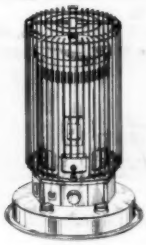


281,996
LAWN SPRINKLER
Ronald G. Hayes, Batavia, Ohio, assignor to L. R. Nelson Corporation, Peoria, Ill.
Filed Apr. 20, 1984, Ser. No. 602,490
Term of patent 14 years
U.S. Cl. D23—8

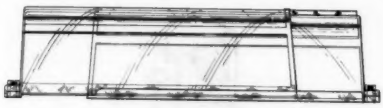


281,997
RAISED TOILET SEAT
Fred DiVito, Northport, N.Y., assignor to Lumex, Inc., Bay Shore, N.Y.
Filed Dec. 14, 1983, Ser. No. 560,883
Term of patent 14 years
U.S. Cl. D23—71

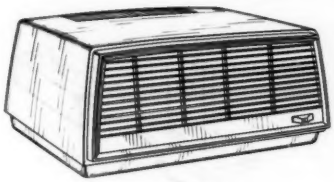
281,998
OILSTOVE
Kazunori Amano, Niitsu, and Youichi Sekigawa, Kamo, both of Japan, assignors to Toshiba Heating Appliances Co., Ltd., Kamo, Japan
Filed Apr. 5, 1984, Ser. No. 597,186
Claims priority, application Japan, Oct. 27, 1983, 58-46427
Term of patent 14 years
U.S. Cl. D23—121



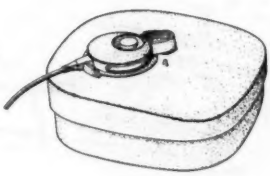
281,999
AIR DEFLECTOR WITH MAGNETIC HOLDERS
Sidney J. Shames, 57 Holly Pl., Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Cir., Ardsley, N.Y. 10502
Filed Jul. 25, 1983, Ser. No. 517,241
Term of patent 14 years
U.S. Cl. D23—138



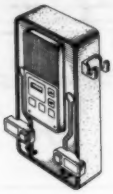
282,000
AIR CLEANER
Alfred W. Madl, Glendale, and Charles J. Kirschling, Whitefish Bay, both of Wis., assignors to Sunbeam Corporation, Oak Brook, Ill.
Filed Jan. 13, 1983, Ser. No. 457,800
Term of patent 14 years
U.S. Cl. D23—149



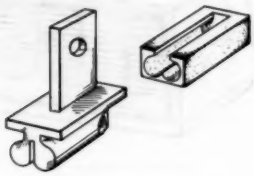
282,001
HUMIDIFIER
Ernst Muchenberger, Zug, Switzerland, assignor to Condair AG, Munchenstein, Switzerland
Filed Jul. 28, 1983, Ser. No. 518,080
Claims priority, application World Int. Prop. O., Mar. 9, 1983, 73001
Term of patent 14 years
U.S. Cl. D23—146



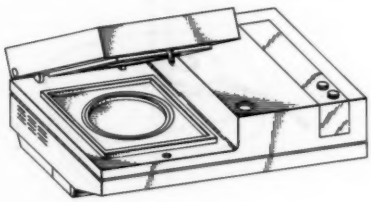
282,002
INTERMITTENT MEDICAL DELIVERY CONTROLLER
Joseph J. Manno; David L. Davis; William W. Busche, all of San Diego, Calif.; Richard B. Conley, Sedona, Ariz.; Robert Mleczko, San Diego, and Craig F. Brown, Solana Beach, both of Calif., assignors to IVAC Corporation, San Diego, Calif.
Filed May 12, 1983, Ser. No. 493,943
Term of patent 14 years
U.S. Cl. D24—8



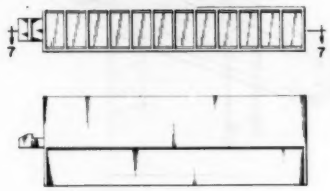
282,003
DEVICE FOR ATTACHING DENTAL BRIDGE TO A TOOTH
Walter Wermuth, Bassecourt, Switzerland, assignor to Cendres et Metaux S.A., Switzerland
Filed Jun. 14, 1982, Ser. No. 378,326
Claims priority, application World Intel. Prop. Org., Nov. 17, 1981, DMA/000094
Term of patent 14 years
U.S. Cl. D24—10



282,004
IRRADIATION DEVICE FOR DENTAL SUBSTANCES
Alexander Neumeister, Munich, Fed. Rep. of Germany, assignor to ESPE Fabrik Pharmazeutischer Praeparate GmbH, Fed. Rep. of Germany
Filed May 3, 1983, Ser. No. 491,046
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1982, 11 AR3701/82
Term of patent 14 years
U.S. Cl. D24—10

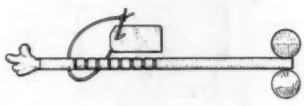


282,005
SPECIMEN HOLDER FOR PHOTOMETRIC MEASUREMENT OF FLUIDS IN AUTOMATIC ANALYZERS
Kimmo Käyhkö, Espoo, Finland, assignor to Kone Oy, Helsinki, Finland
Filed Jul. 30, 1982, Ser. No. 403,551
Claims priority, application Finland, Feb. 5, 1982, 88/82
Term of patent 14 years
U.S. Cl. D24—29



282,006
ARTIFICIAL LEG
Gunnar Marsh, Karlskrona, and Christer Olander, Lyckeby, both of Sweden, assignors to Landstingens Inkopscentral, LIC, ekonomisk forening, Solna, Sweden
Filed Nov. 18, 1982, Ser. No. 442,794
Claims priority, application Sweden, May 18, 1982, 821349
Term of patent 14 years
U.S. Cl. D24—33

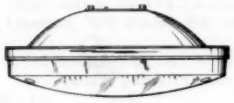
282,007
COMBINED MASSAGER AND BACK SCRATCHER
James C. McKinney, Alpharetta, Ga., assignor to John H. Hagele, Cooper City, Fla.
Filed May 2, 1983, Ser. No. 490,491
Term of patent 14 years
U.S. Cl. D24—36

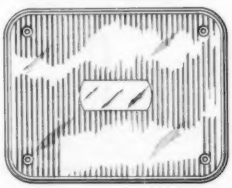


282,008
CHAMBER BASE FOR CATHETER
Richard H. McFarlane, 2571 Kaneville Rd., Geneva, Ill. 60134
Filed Jun. 23, 1983, Ser. No. 507,223
Term of patent 14 years
U.S. Cl. D24—54

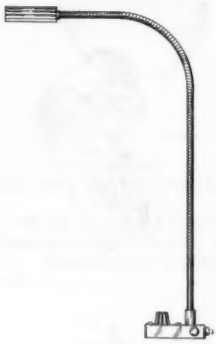
282,009
HOLDER FOR MEDICAL WASTE DISPOSAL CONTAINER
Richard F. Gianni, Danville, Calif., assignor to Biosafety Systems, Inc., San Diego, Calif.
Filed May 2, 1983, Ser. No. 490,866
Term of patent 14 years
U.S. Cl. D24—99

282,010
WIDE ANGLE STROBE LIGHT FOR EMERGENCY VEHICLES OR THE LIKE
Robert A. Ferenc, Middletown, Conn., assignor to Whelen Engineering Company, Inc., Deep River, Conn.
Filed Apr. 5, 1982, Ser. No. 365,343
Term of patent 14 years
U.S. Cl. D26—28





282,011
GOOSENECK LAMP
James H. Fackert, 10555 McCabe Rd., Brighton, Mich. 48116
Filed Oct. 14, 1983, Ser. No. 541,976
Term of patent 14 years
U.S. Cl. D26—62



282,012
LIGHTING FIXTURE
Hans T. Meelen, Geldrop, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Sep. 28, 1983, Ser. No. 536,582
Claims priority, application Benelup, Apr. 5, 1983, 57751-02
Term of patent 14 years
U.S. Cl. D26—63

282,013

HAIR-DRYER

Johann J. Kerschgens, St.-Gotthard-Strasse 44, CH-6460 Altdorf, Switzerland

Filed Jul. 18, 1983, Ser. No. 514,508

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1983, 4172

Term of patent 14 years

U.S. Cl. D28—13

282,014

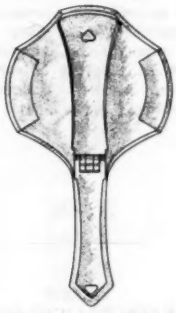
FOLDABLE, LIGHTED HAND MIRROR

Raymond Boyd, 2235 Cambridge Rd., Broomall, Pa. 19008

Continuation-in-part of Ser. No. 55,023, Jul. 5, 1979, Pat. No. Des. 264,387. This application Dec. 28, 1981, Ser. No. 334,902

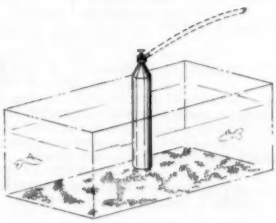
Term of patent 14 years

U.S. Cl. D6—309



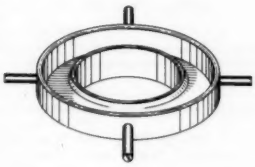
282,015
LIPSTICK CASE
Dieter Bakic, Roemerstrasse 15, D-8000 Munich 40, Fed. Rep. of Germany
Filed Nov. 2, 1983, Ser. No. 547,995
Claims priority, application Fed. Rep. of Germany, May 2, 1983, URA 506/83
Term of patent 14 years
U.S. Cl. D28—86

282,016
AQUARIUM GRAVEL CLEANER
M. Gaines Chestnut, 7175 County Rd. 501, Bayfield, Colo. 81122
Filed Sep. 22, 1982, Ser. No. 421,328
Term of patent 14 years
U.S. Cl. D30—12

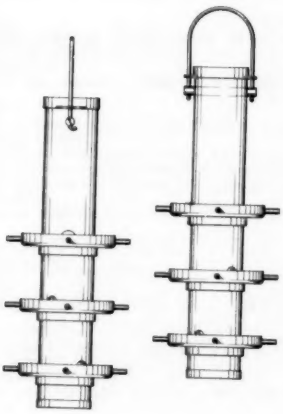


282,017
MINERAL SUPPLEMENT FEEDER
Donald A. Meyer, Dorchester, Wis., assignor to Meyer's Manufacturing Corp., Dorchester, Wis.
Filed Jul. 5, 1983, Ser. No. 510,968
Term of patent 14 years
U.S. Cl. D30—13

282,018
COMBINED TROUGH AND PERCH FOR A BIRD FEEDER
Peter Kilham, Mill Rd., Foster, R.I. 02825
Filed Jun. 12, 1985, Ser. No. 743,916
Term of patent 14 years
U.S. Cl. D30—14



282,019
BIRD FEEDER
Peter Kilham, Mill Rd., Foster, R.I. 02825
Filed Jun. 12, 1985, Ser. No. 743,892
Term of patent 14 years
U.S. Cl. D30—15



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 31ST DAY OF DECEMBER, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Chance Company: *See*—
Hoyt, Robert M.; Dziedzic, Edward; and Rinehart, William M., 4,561,231, Cl. 52-297.000.

AAA Products International: *See*—
Womack, Robert C., 4,561,811, Cl. 408-1.00R.

AB Scaniainventor: *See*—
Siwersson, Olle L.; Wall, Arne E.; and Kristensson, Kent B. G., 4,561,596, Cl. 239-687.000.

Abbes, Claude: *See*—
de Villepoix, Raymond; Fages, Jean; Forges, Robert; Abbes, Claude; and Rouaud, Christian, 4,561,662, Cl. 277-229.000.

Abbott Laboratories: *See*—
Thompson, Kevin R., 4,561,543, Cl. 206-523.000.

Abe, Kishirou: *See*—
Itou, Susumu; Abe, Kishirou; and Kunou, Morishi, 4,561,275, Cl. 72-70.000.

Abe, Mitsuo: *See*—
Miyatake, Satoshi; Abe, Mitsuo; Kume, Masao; Yonemura, Shigehiro; and Umino, Hiroshi, 4,561,216, Cl. 51-165.920.

Abel, Kenneth N.; and Dunn, Gerald R., to Burroughs Corporation. Method of removing a soldered integrated circuit package from a printed circuit board. 4,561,586, Cl. 228-264.000.

Abou-Gharbia, Magid A.: *See*—
Freed, Meier E.; and Abou-Gharbia, Magid A., 4,562,255, Cl. 544-357.000.

Abouchar, Raif: *See*—
Hubert, Jean-Marie; Bauer, Jean-Michel; and Abouchar, Raif, 4,561,461, Cl. 137-561.00A.

Acharya, Arun: *See*—
Nowobilski, Jeffert J.; and Acharya, Arun, 4,561,498, Cl. 165-160.000.

Acke, Edgar, to Siemens Aktiengesellschaft. Coaxial connector. 4,561,716, Cl. 339-177.00R.

Ackley, Paul S. Ultrasonic pest repeller. 4,562,561, Cl. 367-139.000.

Adachi, Ikuo; Yamamori, Teruo; Ueda, Motohiko; and Doteuchi, Masami, to Shionogi & Co., Ltd. 1,6-Dialkyl-3-substituted-4-nitrophenyl-4,7-dihydropyrazolo[3,4-b]pyridine-5-carboxylic acid esters. 4,562,256, Cl. 546-120.000.

Adachi, Yoshiharu; Ando, Masamoto, and Nagashima, Takashi, to Aisin Seiki Kabushiki Kaisha. Brake pressure control device for vehicle braking systems. 4,561,699, Cl. 303-24.00F.

Adams, Gary V.; Ahlf, Wilbur J.; Kirchoff, George F.; and Lange, Rholand E., to Morton Thiokol, Inc. Auto ignition device. 4,561,675, Cl. 280-734.000.

Adams, John T.; and Kompelien, Arlon D., to Honeywell Inc. Power supply for an electrostatic air cleaner with a modulated pulse width voltage input having a backup pulse width limiting means. 4,562,522, Cl. 363-21.000.

Adams, Leon M.: *See*—
Tomlinson, Samuel J., Sr.; Dean, Edward E.; and Adams, Leon M., 4,562,212, Cl. 514-690.000.

Adams, Norman S., to Ortner Freight Car Company. Mounting for the top chords of the sides of a railroad hopper car. 4,561,361, Cl. 105-406.00R.

Ader, Vern L. Implement for flattening cylindrically shaped containers. 4,561,351, Cl. 100-233.000.

Adolphi, Heinrich: *See*—
Theobald, Hans; Adolphi, Heinrich; and Kiehs, Karl, 4,562,259, Cl. 548-112.000.

Adriaansen, David, to Tucker Housewares, Inc. Baby bath. 4,561,135, Cl. 4-572.000.

Advanced Micro Devices, Inc.: *See*—
Rallapalli, Krishna; and Kaku, Shinkyo, 4,562,484, Cl. 358-261.000.

Advanced Solar Systems: *See*—
Gill, Michael T.; and Rogers, Mark C., 4,561,424, Cl. 126-438.000.

Advanced Technology Laboratories, Inc.: *See*—
Hilse, Gernot R. K.; Intlekofer, Michael J.; and Auth, David C., 4,561,807, Cl. 406-99.000.

Aeroquip Corporation: *See*—
Rogers, Russell L., 4,561,465, Cl. 137-614.050.

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Robinson, Alan A., 4,562,430, Cl. 340-870.370.

Agence Spatiale Europeenne-European Space Agency: *See*—
Beretta, Guiliano; and Saitto, Antonio, 4,562,441, Cl. 343-781.00P.

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Yamanobe, Takashi; Mitsuishi, Yasushi; and Takasaki, Yoshiyuki, 4,562,150, Cl. 435-99.000.

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Akiyama, Masahiro; and Akiyama, Yoshihiro, 4,561,916, Cl. 148-175.000.
Kohno, Tsuguo; Yoshida, Yoshitaro; Tenjinbayashi, Koji; and Okazaki, Yuichi, 4,561,333, Cl. 82-1.00C.

Agfa Gevaert Aktiengesellschaft: *See*—
Fursich, Manfred; and Treiber, Helmut, 4,561,768, Cl. 355-38.000.

Agoston, Sandor: *See*—
Horn, Alan S.; and Agoston, Sandor, 4,562,196, Cl. 514-332.000.

Agrifurane, S.A.: *See*—
Le Bigot, Yves; Audoye, Paul; Delmas, Michel; and Gaset, Antoine, 4,562,273, Cl. 549-473.000.

Ahlf, Wilbur J.: *See*—
Adams, Gary V.; Ahlf, Wilbur J.; Kirchoff, George F.; and Lange, Rholand E., 4,561,675, Cl. 280-734.000.

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Aikawa, Norihiro, to Kubota, Ltd. Hydraulic circuitry for a backhoe. 4,561,341, Cl. 91-6.000.

Aimoto, Shingo: *See*—
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Ainlay, John A. Leak detector for underground storage tanks. 4,561,291, Cl. 73-49.200.

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Bellows, Kenneth O., 4,561,492, Cl. 165-8.000.

Air Products and Chemicals, Inc.: *See*—
Grab, George D.; and Dean, Sheldon W., 4,562,052, Cl. 423-235.000.
Wilson, Robert B., Jr.; and Laine, Richard M., 4,562,291, Cl. 564-463.000.

Aisan Industry Co., Ltd.: *See*—
Teramura, Mitsuyoshi; Takimoto, Masatami; Nakamura, Norihiko; Itoh, Takaaki; Katou, Takashi; and Isoya, Yukinori, 4,562,012, Cl. 261-44.00C.

Aisin Seiki Kabushiki Kaisha: *See*—
Adachi, Yoshiharu; Ando, Masamoto; and Nagashima, Takashi, 4,561,699, Cl. 303-24.00F.
Akagi, Motonobu, 4,561,469, Cl. 137-625.470.
Hashimoto, Akio; and Yasuda, Tomio, 4,561,515, Cl. 180-79.100.
Kawai, Taneichi; and Masuda. Mituyoshi, 4,561,691, Cl. 296-216.000.

Aizawa, Tatsushi: *See*—
Niyama, Eisuke; and Aizawa, Tatsushi, 4,561,488, Cl. 164-463.000.

Akagi, Jiro, to Kabushiki Kaisha Komatsu Seisakusho. Fuel injection nozzle assembly. 4,561,590, Cl. 239-96.000.

Akagi, Motonobu, to Aisin Seiki Kabushiki Kaisha. Electromagnetic control valve. 4,561,469, Cl. 137-625.470.

Akatsuka, Takao: *See*—
Nakano, Jiro; Ishibashi, Takao; Akatsuka, Takao; and Takata, Mamoru, 4,561,402, Cl. 123-489.000.

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Miyake, Masao; and Akita, Teruo, 4,562,108, Cl. 428-212.000.

Akiyama, Masahiro; and Akiyama, Yoshihiro, to Agency of Industrial Science and Technology; and Ministry of International Trade and Industry. Meth.. of growth of compound semiconductor. 4,561,916, Cl. 148-175.000.

Akiyama, Tetsuo: *See*—
Hatakenaka, Toshiki; Akiyama, Tetsuo; Asada, Shinji; and Shinohara, Kunio, 4,561,800, Cl. 404-79.000.

Akiyama, Yoshihiro: *See*—
Akiyama, Masahiro; and Akiyama, Yoshihiro, 4,561,916, Cl. 148-175.000.

Aktiebolaget Hassle: *See*—
Appelgren, Curt H.; Bogentoft, Conny B.; and Ekenved, Gunnar H., 4,562,061, Cl. 424-32.000.

Alary, Jean-Andre ; Cot, Louis; Gugliermotte, Francis; Larbot, Andre ; and Guizard, Christian, to Ceraver, S.A. Method of manufacturing a medium for microfiltration, for ultrafiltration, or for reverse osmosis. 4,562,021, Cl. 264-43.000.

Albert Einstein College of Medicine, A Division of Yeshiva Univ.: *See*—
Shafritz, David A., 4,562,159, Cl. 436-501.000.

Alberta Gas Chemicals Ltd.: *See*—
Stiles, Alvin B., 4,562,174, Cl. 502-174.000.

Albone, Robert C.: *See*—
Conway, John T.; and Albone, Robert C., 4,562,429, Cl. 340-657.000.

Aldridge, Byron D. Universal clevis. 4,561,797, Cl. 403-58.000.

Alessio, Lorenzo E., to Black & Decker Inc. Multipurpose hand truck with movable wheels. 4,561,674, Cl. 280-655.000.

Alexander, Richard J.: *See*—
Smolka, George E.; and Alexander, Richard J., 4,562,086, Cl. 426-578.000.

Alfa-Laval, Inc.: *See*—
Ruggiero, Frank J., 4,562,085, Cl. 426-577.000.

Alksninis, Audra T.: *See*—
Ellis, Richard G.; and Alksninis, Audra T., 4,561,646, Cl. 271-236.000.

Allen, Douglas, Jr.; and Flam, Eric, to C. R. Bard. Ostomy bag with integral breathable gasket. 4,561,858, Cl. 604-336.000.

Alley, Robert P.; Harnden, John D., Jr.; and Kornrumpf, William P., to General Electric Company. Magnetoelastic force/pressure sensor. 4,561,314, Cl. 73-862.690.

Allia, Frank S. Sailboarding equipment vehicle. 4,561,667, Cl. 280-47.13B.

Allied Corporation: *See*—
Brush, Robert W., Jr.; and Waghorn, Robert D., 4,561,179, Cl. 29-866.000.
Li, Hsin L.; and Oswald, Hendrikus J., 4,562,022, Cl. 264-54.000.
Ott, William E., 4,561,523, Cl. 188-79.50K.

Alm, Arthur L., to Schuler, Murry W., a part interest. Combine sieve plate. 4,561,972, Cl. 209-254.000.

Alpha Enterprises, Inc.: *See*—
Hehn, Bruce A., 4,561,200, Cl. 40-156.000.

Alps Electric Co., Ltd.: *See*—
Hosogoe, Junichi; Suzuki, Motoyuki; and Ida, Yuichi, 4,562,314, Cl. 200-5.00R.

Alsobrooks, Daniel E.: *See*—
Johnson, Kalin S.; and Alsobrooks, Daniel E., 4,561,158, Cl. 29-156.40R.

Altmann, Josef; and Ratislav, Jaromir, to Skoda, koncernova podnik. Apparatus for vacuum cleaning of oil fillings. 4,561,866, Cl. 55-166.000.

Amano, Yoshifumi, to Sony Corporation. Plasma display panel. 4,562,434, Cl. 340-775.000.

Amchem Products Inc.: *See*—
Ahmed, Bashir M., 4,562,098, Cl. 427-341.000.

Amemiya, Shigeo: *See*—
Murano, Kazuo; Soejima, Tetsuo; and Amemiya, Shigeo, 4,562,573, Cl. 370-85.000.

American Cyanamid: *See*—
Hirschbuehler, Kevin, 4,562,217, Cl. 523-466.000.

American Cyanamid Company: *See*—
Petrocine, David V., 4,562,257, Cl. 546-169.000.
Tomcufcik, Andrew S.; Meyer, Walter E.; and Tseng, Shin S., 4,562,189, Cl. 514-252.000.
Wang, David W.; Fisher, Michael M.; and Thomas, Walter M., 4,562,246, Cl. 528-423.000.

American Home Products Corporation: *See*—
Asselin, Andre A.; Crosilla, Danilo A.; and Humber, Leslie G., 4,562,200, Cl. 514-415.000.
Freed, Meier E.; and Abou-Gharbia, Magid A., 4,562,255, Cl. 544-357.000.

American Hospital Supply Corporation: *See*—
Stout, David M.; and Matier, William L., 4,562,201, Cl. 514-422.000.

American Maize-Products Company: *See*—
Smolka, George E.; and Alexander, Richard J., 4,562,086, Cl. 426-578.000.

American Manufacturing Company, Inc.: *See*—
Houpt, Grover K.; and Kayros, Richard, 4,561,320, Cl. 74-128.000.

American Motors Corporation: *See*—
Stromberg, Clinton V., 4,561,323, Cl. 74-493.000.

American Sterilizer Company: *See*—
Sestak, Joseph T.; and Kagan, Jonathan, 4,562,047, Cl. 422-300.000.

Amerigo Technology Limited: *See*—
Wong, Tony C. T., 4,561,503, Cl. 166-307.000.

Amici, Francis R.; and Piazza, Pietro, to Coleco Industries, Inc. Creature with snap action jaw. 4,561,854, Cl. 446-304.000.

Amicon Corporation: *See*—
Fulton, Scott; Yankopoulos, Basil; and Zediana, Lewis, Jr., 4,562,251, Cl. 536-17.400.

AMP Incorporated: *See*—
Dola, Frank P., 4,562,311, Cl. 179-158.00R.
Fukukura, Kazutoyo, 4,561,709, Cl. 339-17.00F.
van de Kerkhof, Lodevicus L. J., 4,561,178, Cl. 29-749.000.

Ampex Corporation: *See*—
Baker, Jay S., 4,562,406, Cl. 330-85.000.
O'Gwynn, David C.; and Helmers, Thomas L., 4,561,608, Cl. 242-186.000.

AMSTED Industries Incorporated: *See*—
Mulcahy, Harry W., 4,561,360, Cl. 105-199.00S.

Analog Devices, Incorporated: *See*—
Narasimhan, Tanjore R., 4,562,400, Cl. 323-281.000.

Analogic Corporation: *See*—
Mattedi, Bruno A.; and Watari, Hiromichi, 4,562,553, Cl. 364-745.000.

Anand, Vidhu: *See*—
Kumar, Prabhat; and Anand, Vidhu, 4,561,892, Cl. 75-251.000.

Anders, Peter. Clamping device for long trousers, particularly in suitcases. 4,561,539, Cl. 206-279.000.

Andersen, Brad E.; Hamilton, Billy H.; and Schroeder, Robert E., to AT&T Bell Laboratories. Alarm limit recentering arrangement for maintaining uniform alarm limit tolerances about a sloping regulation characteristic. 4,562,548, Cl. 364-483.000.

Andersen, Helge H., to Kongskilde Koncernselskab A/S. Flexible tine harrow for the preparation of seed beds. 4,561,504, Cl. 172-142.000.

Anderson, Alan S., to Williamson Corporation. Temperature measuring apparatus. 4,561,786, Cl. 374-129.000.

Andersson, Finn, to Desco K/S. Process of cleaning flue gases from heating plants. 4,562,053, Cl. 423-235.000.

Ando, Kenji: *See*—
Nakamura, Takeshi; Matsumoto, Ikuo; and Ando, Kenji, 4,562,372, Cl. 310-321.000.

Ando, Masamoto: *See*—
Adachi, Yoshiharu; Ando, Masamoto; and Nagashima, Takashi, 4,561,699, Cl. 303-24.00F.

Ando, Saburo: *See*—
Nishizawa, Hiroshi; Ando, Saburo; and Ito, Syuji, 4,562,532, Cl. 364-200.000.

Ando, Shinichi: *See*—
Kumekawa, Kazuhisa; and Ando, Shinichi, 4,561,274, Cl. 72-54.000.

Andra, Klaus; Hutschenruter, Elfriede; and Besier, Horst-Erich, to Hoechst Aktiengesellschaft. Shirred sausage casing and process for its production. 4,562,101, Cl. 428-36.000.

Anelva Corporation: *See*—
Shiokawa, Yoshiro, 4,562,352, Cl. 250-305.000.

Angell, William M.: *See*—
Matheny, William F., III; Bernard, Clay, II; and Angell, William M., 4,561,820, Cl. 414-331.000.

Anglo-American Clays Corp.: *See*—
Cook, Jerry A.; Garner, Robert H.; Turner, Ralph E., Jr.; and Bilimoria, Bomi M., 4,561,597, Cl. 241-17.000.

ANT Nachrichtentechnik GmbH: *See*—
Wassermann, Manfred; and Liebisch, Wolfgang, 4,562,407, Cl. 330-129.000.

Antonelli, Christopher C., to Antonelli Plating Co. Apparatus for rinsing electroplating solution from articles. 4,561,956, Cl. 204-232.000.

Antonelli Plating Co.: *See*—
Antonelli, Christopher C., 4,561,956, Cl. 204-232.000.

Antonov, Vladimir M.: *See*—
Kudinov, Gennady A.; Kasyanov, Grigory I.; Lysenko, Evgeny E.; Tolochko, Alexei I.; Yazev, Vasily A.; and Antonov, Vladimir M., 4,561,639, Cl. 266-193.000.

Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizu, Susumu; Watanabe, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, to Kureha Kagaku Kogyo Kabushiki Kaisha. Derivatives of tetrahydrobenzothiazole and herbicidal compositions containing the same as active ingredient. 4,561,877, Cl. 71-90.000.

Aoki, Masahiro; Nakamura, Junichi; Ida, Masatoshi; Oinoue, Kenichi; and Hayashi, Asao, to Toyota Jidosha Kabushiki Kaisha. Method and apparatus for detecting focus conditions of a photographic optical system. 4,562,345, Cl. 250-201.000.

Aoki, Masahiro: *See*—
Hayashi, Asao; Oinoue, Kenichi; Aoki, Masahiro; and Ida, Masatoshi, 4,562,346, Cl. 250-201.000.

Aoki, Mitsuo: *See*—
Inoue, Satoru; Uchida, Mitsuru; Yamaguchi, Kimitoshi; Aoki, Mitsuo; Tomita, Masami; and Uematsu, Chiaki, 4,562,136, Cl. 430-107.000.

Aoki, Tomohiro; and Tanaka, Hidetoshi, to Canon Kabushiki Kaisha. Both-side recording apparatus. 4,561,767, Cl. 355-26.000.

Aoyagi, Yukio; Izumi, Eiki; Yamaguchi, Takeshi; and Tanaka, Sotaro, to Hitachi Construction Machinery Co., Ltd. Hydraulic drive system having a plurality of prime movers. 4,561,250, Cl. 60-430.000.

Aoyagi, Yukio: *See*—
Watanabe, Hiroshi; Izumi, Eiki; Aoyagi, Yukio; Honma, Kazuo; and Nakajima, Kichio, 4,561,249, Cl. 60-421.000.

Appelgren, Curt H.; Bogentoft, Conny B.; and Ekenved, Gunnar H., to Aktiebolaget Hassle. Pharmaceutical preparation. 4,562,061, Cl. 424-32.000.

Aprillis 4. Bepipari Muvek: *See*—
Vagan, Ferenc, 4,561,607, Cl. 242-118.400.

Apsley Metals Limited: *See*—
Sumner, Anthony J. M., 4,561,927, Cl. 156-406.200.

APV Equipment, Incorporated: *See*—
Dinnage, Derek F.; and Worrall, George F., 4,561,941, Cl. 203-24.000.

Arabori, Hideo: *See*—
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizu, Susumu; Watanabe, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,561,877, Cl. 71-90.000.

Arachnid, Inc.: *See*—
Zammuto, Samuel N., 4,561,660, Cl. 273-376.000.

Arai, Kiyotaka: *See*—
Suhara, Manabu; Sajima, Yasuo; Ito, Hiroaki; and Arai, Kiyotaka, 4,561,946, Cl. 204-98.000.

Arai, Masayuki: *See*—
Ogasawara, Terumi; Arai, Masayuki; and Shikano, Tohru, 4,562,477, Cl. 358-228.000.
Shikano, Tohru; Ogasawara, Terumi; and Arai, Masayuki, 4,562,476, Cl. 358-228.000.

Arai, Takao: *See*—
Tanaka, Hiromichi; Kimura, Hiroyuki; Noda, Tsutomu; Arai, Takao; Kobayashi, Masaharu; and Inoue, Shigeki, 4,562,549, Cl. 364-486.000.

Arav, Ronnie A., to Beloit Corporation. Paper forming. 4,561,379, Cl. 118-126.000.

Arbed S.A.: *See*—
Schleimer, Francois, 4,561,637, Cl. 266-81.000.

Arena, Aldo, to Grumman Aerospace Corp. Torque joint. 4,561,799, Cl. 403-285.000.

Arets, Jan W.; and Stinessen, Bernardus J., to U.S. Philips Corporation. Record-disc player comprising a braking mechanism for braking a disc. 4,562,563, Cl. 369-79.000.

Arika, Junji; Miyazaki, Hiroshi; Igawa, Kazushige; and Itabashi, Keiji, to Toyo Soda Manufacturing Co., Ltd. Process for preparation of zeolites. 4,562,055, Cl. 423-329.000.

Arimatsu, Yoshikazu: *See*—
Yamane, Noriomi; Arimatsu, Yoshikazu; Katsuo, Kenichi; Saitoh, Minoru; Tani, Katsya; Mitamura, Hideyuki; and Hiroyoshi, Kamatani, 4,562,239, Cl. 528-65.000.

Arimoto, Akira: *See*—
Kataoka, Keiji; Saito, Susumu; Arimoto, Akira; Hashimoto, Akira; and Tatsuno, Kimio, 4,561,717, Cl. 350-6.800.

Arimura, Akira: *See*—
Chang, Ding; Arimura, Akira; Culler, Michael D.; and Chang, Jaw-Kang, 4,562,175, Cl. 514-12.000.

Arita, Yosihumi; Katsuki, Kosuke; and Tabuchi, Sadao, to Toray Industries, Inc. Winding method and apparatus for multifilament fiber bundle. 4,561,601, Cl. 242-35.50R.

Armstrong, Gregory J.: *See*—
Doering, Robert R.; and Armstrong, Gregory J., 4,561,170, Cl. 29-571.000.

Armstrong World Industries, Inc.: *See*—
Fornadel, J. Stephen; and Long, Harry F., 4,562,218, Cl. 524-15.000.
Forry, John S.; and Garrick, John R., 4,562,510, Cl. 361-212.000.

Arnold, Anthony F.; and Schmeckenbecher, Arnold F., to International Business Machines Corporation. Process for forming a high density metallurgy system on a substrate and structure thereof. 4,562,513, Cl. 361-409.000.

Arnold, Kurt: *See*—
Kreitchman, Morton A.; and Arnold, Kurt, 4,561,468, Cl. 137-625.500.

Arnold, Todd W.; and Patel, Mansukh M., to Wm. Wrigley Jr. Company. Chewing gum with coating of thaumatin or monellin and method. 4,562,076, Cl. 426-5.000.

Arpesella, Marco, to Pro. Bio. Spe. S.r.l. Low-profile biological bicuspid valve. 4,561,129, Cl. 623-2.000.

Arquie , Louis: *See*—
Thirouard, Michel; and Arquie , Louis, 4,562,350, Cl. 250-239.000.

Arrowsmith, David R.: *See*—
Young, Alastair J.; Arrowsmith, David R.; and Parsons, David, 4,561,531, Cl. 192-85.0CA.

Artos Engineering Company: *See*—
Randar, Magnus; and Moore, David G., 4,561,155, Cl. 29-33.00M.

Asada, Shinji: *See*—
Hatakenaka, Toshiki; Akiyama, Tetsuo; Asada, Shinji; and Shinohara, Kunio, 4,561,800, Cl. 404-79.000.

Asahara, Eiko: *See*—
Watanabe, Keiichiro; Yamada, Tomiaki; Sazanami, Tsuneo; and Asahara, Eiko, 4,562,154, Cl. 435-162.000.

Asahi Glass Company Ltd : *See*—
Suhara, Manabu; Sajima, Yasuo; Ito, Hiroaki; and Arai, Kiyotaka, 4,561,946, Cl. 204-98.000.

Asahi Kasei Textiles Ltd.: *See*—
Miyake, Masao; and Akita, Teruo, 4,562,108, Cl. 428-212.000.

Asahi Seimitsu Kabushiki Kaisha: *See*—
Ogasawara, Terumi; Arai, Masayuki; and Shikano, Tohru, 4,562,477, Cl. 358-228.000.
Shikano, Tohru; Ogasawara, Terumi; and Arai, Masayuki, 4,562,476, Cl. 358-228.000.

Asai, Osamu: *See*—
Maeda, Kunihiro; Usami, Katsuhisa; Takeda, Yukio; Ogihara, Satoru; and Asai, Osamu, 4,561,891, Cl. 75-238.000.

Asai, Ryuichi; Okamato, Takeshi; and Minagawa, Shoichi, to Clarion Co., Ltd. Rayleigh surface-acoustic-wave device using ZnO(0001)-/SiO_2/Si(111) [112]. 4,562,371, Cl. 310-313.00A.

Asakura, Masahiko: *See*—
Dobashi, Yoshitomi; Asakura, Masahiko; and Kohmoto, Kohtaro, 4,562,379, Cl. 313-619.000.
Kishida, Eiji; and Asakura, Masahiko, 4,561,394, Cl. 123-179.00G.

Asaoka, Sachio; Sendo, Takashi; and Nakamura, Munekazu, to Chiyoda Chemical Engineering & Construction Co., Ltd. Method of preparing alumina. 4,562,059, Cl. 423-626.000.

ASEA Aktiebolag: *See*—
Bachler, Sven, 4,562,418, Cl. 335-131.000.
Brogardh, Torgny; Hok, Bertil; and Ovren, Christer, 4,562,348, Cl. 250-231.00R.

ASEA Electric, Inc.: *See*—
Kranich, Neil J., II, 4,562,316, Cl. 200-16.00D.

Ashland Oil, Inc.: *See*—
Beck, H. Wayne; Carruthers, James D.; Cornelius, Edward B.; Kmecak, Ronald A.; Kovach, Stephen M.; and Hettinger, William P., Jr., 4,561,968, Cl. 208-120.000.
Goel, Anil B.; and Tufts, Timothy A., 4,562,240, Cl. 528-73.000.

Asker, Gunnar C. F. Wind ship propulsion system. 4,561,374, Cl. 114-103.000.

Assedo, Raphael; and Dubreux, Eric, to Framatome & Cie. Device for guiding a control cluster in a nuclear reactor. 4,562,038, Cl. 376-353.000.

Asselin, Andre A.; Crosilla, Danilo A.; and Humber, Leslie G., to American Home Products Corporation. 5(Indolyl) and 5(2,3-dihydroindolyl) substituted aminoethanols and their use as anti-hypertensives. 4,562,200, Cl. 514-415.000.

Associates Group Partners, The: *See*—
Loechner, John T.; Kruger, Kurt J.; Nottingham, John R.; and Golembex, Joe M., 4,561,416, Cl. 126-21.00A.

Astra Lakemedel Aktiebolag: *See*—
Broberg, Berndt F. J.; and Evers, Hans C. A., 4,562,060, Cl. 424-28.000.

AT&T Bell Laboratories: *See*—
Andersen, Brad E.; Hamilton, Billy H.; and Schroeder, Robert E., 4,562,548, Cl. 364-483.000.
Berenbaum, Alan D.; Jagannathan, Anand; Molinelli, John J.; and Pekarich, Steven P., 4,562,538, Cl. 364-200.000.
Coleman, Charles L.; and Rubin, Harvey, 4,562,436, Cl. 340-825.000.
Duttweiler, Donald L., 4,562,312, Cl. 179-170.200.
Goodby, John W.; Leslie, Thomas M.; and Patel, Jayantilal S., 4,561,726, Cl. 350-341.000.

AT&T Technologies, Inc.: *See*—
Zado, Frank M., 4,561,913, Cl. 148-23.000.

Atchley, Raymond. End effector. 4,561,686, Cl. 294-64.100.

Atherton, Paul; Burns, Peter; and Green, Brian N., to VG Instruments Group Limited. Sample introduction device for mass spectrometers. 4,562,351, Cl. 250-288.000.

Atkinson, Robert W., to Snyder Laboratories, Inc. Lavage system with linear motor. 4,561,431, Cl. 128-66.000.

Atlantic Research Corporation: *See*—
Isbister, Jenefir D.; and Doyle, Richard C., 4,562,156, Cl. 435-253.000.

Atlantic Richfield Company: *See*—
Ball, Bennett D., 4,561,245, Cl. 60-39.020.
Dean, Barry D., 4,562,231, Cl. 525-189.000.

Audoye, Paul: *See*—
Le Bigot, Yves; Audoye, Paul; Delmas, Michel; and Gaset, Antoine, 4,562,273, Cl. 549-473.000.

Auer, C. J.: *See*—
Lack, Larry H., 4,561,329, Cl. 81-62.000.

Auer, Frank M.: *See*—
Lack, Larry H., 4,561,329, Cl. 81-62.000.

Aufderheide, Brian E., to W. H. Brady Co. Capacitance membrane switch. 4,562,315, Cl. 200-5.00A.

Aumann, James P. Open sleigh that disassembles to a generally flat storage position and assembles into an interlocked operating position. 4,561,666, Cl. 280-20.000.

Austin, Barry G., to General Aluminum Products, Inc. Patio enclosure. 4,561,227, Cl. 52-226.000.

Auth, David C.: *See*—
Hilse, Gernot R. K.; Intlekofer, Michael J.; and Auth, David C., 4,561,807, Cl. 406-99.000.

Auth, Gerald L., to Midac Corporation. Apparatus and method for photoluminescence analysis. 4,562,356, Cl. 250-458.100.

Automotive Products plc: *See*—
Parsons, David; Windsor, Harry M.; and Comfort, John V., 4,561,530, Cl. 192-0.076.
Young, Alastair J.; Arrowsmith, David R.; and Parsons, David, 4,561,531, Cl. 192-85.0CA.

AVX Corporation: *See*—
Scrantom, Dehart G.; and Hopkins, Lonnie, 4,561,954, Cl. 204-192.00R.

Axelrod, Randolph H.; and Piascinski, Joseph J., to RCA Corporation. Heat-resistant, optically-black coating. 4,562,120, Cl. 428-469.000.

Axelrod, Robert J., to General Electric Company. Process for preparing aryl phosphates. 4,562,011, Cl. 260-978.000.

Ayache, Charles. Eyeglass frame. 4,561,734, Cl. 351-103.000.

B. F. Goodrich Company, The: *See*—
Percec, Virgil, 4,562,243, Cl. 528-174.000.
Weisend, Norbert A., Jr., 4,561,613, Cl. 244-134.00A.

B & R Choiniere: *See*—
Laliberte, Jacques; and Choiniere, Gabriel, 4,561,805, Cl. 406-71.000.

Baba, Akinori, to Mitsubishi Denki Kabushiki Kaisha. Backup control apparatus. 4,562,528, Cl. 364-133.000.

Babany, Lucien: *See*—
Bursztejn, Jacques; and Babany, Lucien, 4,562,307, Cl. 179-2.00E.

Babcock & Wilcox Company, The: *See*—
Bohl, Thomas L., 4,562,044, Cl. 422-64.000.
Campo, Juan J., 4,561,802, Cl. 405-195.000.
Enterline, Larry L.; and Kaya, Azmi, 4,562,531, Cl. 364-164.000.
Gerber, David W., 4,561,680, Cl. 285-98.000.
Keyes, Marion A., IV; and Thompson, William L., 4,561,311, Cl. 73-861.220.
Richman, Lonnie J.; and Stockmaster, Edward F., 4,561,558, Cl. 220-203.000.

Bachler, Sven, to ASEA Aktiebolag. Electromagnetically operated electric switch. 4,562,418, Cl. 335-131.000.

Bachmann, Henry C.; Brown, Omar L.; Fraze, Ermal C.; Gregg, James R.; and Wynn, David K., to Dayton Reliable Tool & Mfg. Co. Shell making method and apparatus. 4,561,280, Cl. 72-346.000.

Bachschmid, Reiner: *See*—
Zeilinger, Karl; and Bachschmid, Reiner, 4,561,634, Cl. 251-364.000.

Bactex Corporation: *See*—
Wood, Sarah W., 4,562,070, Cl. 424-92.000.

Badon, Aime ; Berthonnier, Jean-Yves; and Mounier, Claude, to Merlin Gerin. Metal-clad puffer-type circuit-breaker having closing resistors. 4,562,319, Cl. 200-144.0AP.

Baer, Martin D. Shower track. 4,561,136, Cl. 4-615.000.

Baika, Toyokazu: *See*—
Nakamura, Norihiko; Baika, Toyokazu; Shibata, Yoshiaki; and Miki, Toshio, 4,561,390, Cl. 123-90.150.

Bailey, John W.: *See*—
Turner, Laurence F.; Bailey, John W.; and Parrish, Henry H., 4,562,425, Cl. 340-347.0DD.

Baker, Jay S., to Ampex Corporation. Current controlled amplifier. 4,562,406, Cl. 330-85.000.

Baker, Philip G.: *See*—
Plummer, William T.; and Baker, Philip G., 4,561,753, Cl. 354-432.000.

Baldwin, John J.; and Ponticello, Gerald S., to Merck & Co., Inc. Substituted-aminohydroxypropoxy-thiadiazoles, β-blocking compositions and use. 4,562,184, Cl. 514-222.000.

Ball, Bennett D., to Atlantic Richfield Company. Turbine anti-icing system. 4,561,245, Cl. 60-39.020.

Balli, Heinz; Gunzenhauser, Sigmund; Fletcher, Ian J.; and Bedekovic, Davor, to Ciba-Geigy Corporation. Chromogenic dihydroquinazolines. 4,562,449, Cl. 346-218.000.

Ballu, Patrick J. M., to Tecnoma. Mobile apparatus for spraying a liquid for the treatment of plants. 4,561,591, Cl. 239-159.000.

Bally Midway Mfg. Co.: *See*—
Byczek, Roger W.; and Wurz, Norman R., 4,561,714, Cl. 339-97.00P.

Bansal, Ravinder K.: *See*—
McCombs, Norman R.; and Bansal, Ravinder K., 4,561,865, Cl. 55-25.000.

Barabash, Martin J.: *See*—
Barker, Graham; and Barabash, Martin J., 4,562,214, Cl. 514-844.000.

Barbagli, Rino O.; and Marras, Gaetano, to Fiat Allis Europe S.p.A. Steering device for a hydrostatic-drive vehicle, in particular a crawler-mounted earth-moving machine. 4,561,513, Cl. 180-6.480.

Barbanti-Brodano, Giuseppe: *See*—
Ricciardi, Robert P.; Barbanti-Brodano, Giuseppe; and Milanesi, Gabriele, 4,562,155, Cl. 435-172.300.

Barker, Graham; and Barabash, Martin J., to Witco Chemical Corporation. Personal care emulsion. 4,562,214, Cl. 514-844.000.

Barmag Barmer Maschinenfabrik AG: *See*—
Schippers, Heinz; Lenk, Erich; Schiminski, Herbert; and Turk, Herbert, 4,561,603, Cl. 242-43.00A.
Turk, Herbert; and Schiminski, Herbert, 4,561,244, Cl. 57-336.000.

Barmag Barmer Maschinenfabrik Aktiengesellschaft: *See*—
Schippers, Heinz; and Munnekehoff, Gerd, 4,561,602, Cl. 242-35.50A.

Barnard, Richard H.; and Stock, Terence P., to ITT Industries, Inc. Fluid flow measurement. 4,561,310, Cl. 73-861.020.

Barnes, Brian R.: *See*—
Tusinski, Joseph; Barnes, Brian R.; and Mathews, Herbert H., 4,561,213, Cl. 51-105.0LG.

Barnett, Howard S.; Cochran, Michael J.; and Poland, Sid, to Texas Instruments Incorporated. High speed processor. 4,562,537, Cl. 364-200.000.

Baron, Walter J., to Water Service of America, Inc. Alignment of basket retainer clips for heat exchanger tube cleaning elements. 4,561,495, Cl. 165-95.000.

Barrell, Kenneth: *See*—
Carter, Moira A.; and Barrell, Kenneth, 4,562,215, Cl. 523-220.000.

Barth, Merlyn; and Kosednar, Joseph, to Interface Control Systems, Inc. Jackpot-resistant magnetic card encoding. 4,562,490, Cl. 360-44.000.

Basch, Duane C., to Xerox Corporation. Drum support apparatus. 4,561,763, Cl. 355-3.0DR.

BASF Aktiengesellschaft: *See*—
Laas, Harald; Tavs, Peter; Hannebaum, Heinz; and Stroezel, Manfred, 4,562,277, Cl. 556-34.000.
Rieber, Norbert; Bohm, Heinrich; Platz, Rolf; and Fuchs, Werner, 4,562,262, Cl. 548-257.000.
Schnabel, Rolf; and Weitz, Hans M., 4,562,283, Cl. 560-204.000.
Schneider, Heinz-Walter; Kummer, Rudolf; and Zimmerling, Dieter, 4,561,942, Cl. 203-96.000.
Steiner, Gerd, 4 562,004, Cl. 260-396.00R.
Theobald, Hans; Adolphi, Heinrich; and Kiehs, Karl, 4,562,259, Cl. 548-112.000.
Varwig, Jurgen; Hamprecht, Gerhard; and Rohr, Wolfgang, 4,562,254, Cl. 544-92.000.

BASF Wyandotte Corporation: *See*—
Korczak, Alexander; and Levis, William W., Jr., 4,562,290, Cl. 564-399.000.

Bates, Lyn V. Orthodontic bracket. 4,561,844, Cl. 433-14.000.

Batham, John K.: *See*—
Fontaine, Paul J.; Jones, Evan T. R.; and Batham, John K., 4,561,894, Cl. 75-257.000.

Batson, David C.: *See*—
Goebel, Franz; Haskins, Timothy B.; and Batson, David C., 4,562,094, Cl. 427-115.000.

Battelle Memorial Institute: *See*—
Kenan, Richard P.; and Verber, Carl M., 4,561,728, Cl. 350-356.000.
Muralidhara, Harapanahalli; Parekh, Bhupendra; and Senapati, Nagabhusan, 4,561,953, Cl. 204-182.300.

Bauer, Jean-Michel: *See*—
Hubert, Jean-Marie; Bauer, Jean-Michel; and Abouchar, Raif, 4,561,461, Cl. 137-561.00A.

Bauer, Martin W.; Thys, Carl J.; Fredriksen, Peter A.; Robin, David J.; and Schaar, Richard J., to International Jensen Incorporated. Front panel for electronic device such as an automotive radio and method for installing same. 4,562,595, Cl. 455-345.000.

Baumgartner, Edward W.: *See*—
Ehring, Carolyn C.; and Baumgartner, Edward W., 4,561,121, Cl. 2-2.000.

Baxter, John: *See*—
Bishop, Arthur E.; and Baxter, John, 4,561,516, Cl. 180-142.000.

Bayer Aktiengesellschaft: *See*—
Elbe, Hans-Ludwig; Jautelat, Manfred; Buchel, Karl H.; Brandes, Wilhelm; Hanssler, Gerd; and Reinecke, Paul, 4,562,198, Cl. 514-383.000.
Goliasch, Karl; Muller, Herbert; and Pelster, Heinrich, 4,562,010, Cl. 260-546.000.
Hajek, Manfred; Muller, Hanns P.; and Rasshofer, Werner, 4,562,289, Cl. 564-2.000.
Hegasy, Ahmed; Rupp, Roland; Ramsch, Klaus-Dieter; and Luchtenberg, Helmut, 4,562,069, Cl. 424-80.000.
Jager, Gerhard; Fauss, Rudolf; Findeisen, Kurt; Becker, Benedikt; and Homeyer, Bernhard, 4,562,185, Cl. 514-229.000.
Kuhle, Engelbert; Paulus, Wilfried; Genth, Hermann; Brandes, Wilhelm; and Reinecke, Paul, 4,562,208, Cl. 514-593.000.
Rauleder, Gebhard; Waldmann, Helmut; Bottenbruch, Ludwig; Traenckner, Hans-Joachim; and Gau, Wolfgang, 4,562,274, Cl. 549-525.000.
Schwirtlich, Ingo; Woditsch, Peter; and Koch, Wolfgang, 4,561,930, Cl. 156-616.00R.
Steinberger, Helmut; and Clarenz, Werner, 4,562,223, Cl. 524-506.000.
Thomas, Rudolf; Draber, Wilfried; Schmidt, Robert R.; and Eue, Ludwig, 4,561,879, Cl. 71-92.000.

Bayer, Thomas E., to R. D. Werner Co., Inc. Method and apparatus for making hook to rail connection for scaffolds or the like. 4,561,165, Cl. 29-522.00R.

BBC Brown, Boveri & Company, Ltd.: *See*—
Czech, Franz, 4,562,303, Cl. 174-142.000.
Herzig, Peter, 4,562,359, Cl. 307-113.000.
Jaussi, Francois A.; Mayer, Andreas; and Spinnler, Fritz W., 4,561,407, Cl. 123-559.000.

Beach, Burt L.: *See*—
Tremain, David L.; Beach, Burt L.; and Rimington, David J., 4,561,305, Cl. 73-323.000.

Beal, Gerard; and Coutures, Jean-Louis, to Thomson-CSF. Transverse charge transfer filter. 4,562,417, Cl. 333-165.000.

Beatty, Robert M.; Huber, Paul G.; and Miller, Edward B., to General Electric Company. Remote load control relay processor. 4,562,550, Cl. 364-492.000.

Beaumont, Paul, to Lucas Industries Limited. Air compressor having condition responsive clutch control. 4,561,827, Cl. 417-223.000.

Beck, Christian A.: *See*—
Wittstein, Martin D.; and Beck, Christian A., 4,561,567, Cl. 222-83.500.

Beck, H. Wayne; Carruthers, James D.; Cornelius, Edward B.; Kmecak, Ronald A.; Kovach, Stephen M.; and Hettinger, William P., Jr., to Ashland Oil, Inc. Carbometallic oil conversion with zeolite y containing catalyst. 4,561,968, Cl. 208-120.000.

Becka, Michael M.; and Goodenough, William G., to International Shoe Machine Corporation. Machine for automatically roughing the cement margin of a footwear upper assembly. 4,561,139, Cl. 12-1.00R.

Becker, Benedikt: *See*—
Jager, Gerhard; Fauss, Rudolf; Findeisen, Kurt; Becker, Benedikt; and Homeyer, Bernhard, 4,562,185, Cl. 514-229.000.

Becker, Reinhard: *See*—
Urbach, Hansjorg; Henning, Rainer; Teetz, Volker; Wissmann, Hans; and Becker, Reinhard, 4,562,202, Cl. 514-423.000.

Becton, Dickinson and Company: *See*—
Stoermer, Ralph T., III; and Darner, James C., 4,562,051, Cl. 423-219.000.

Bedekovic, Davor: *See*—
Balli, Heinz; Gunzenhauser, Sigmund; Fletcher, Ian J.; and Bedekovic, Davor, 4,562,449, Cl. 346-218.000.

Bedell, John R., to Electric Power Research Institute. Vacuum belt hugger for casting of ribbon. 4,561,487, Cl. 164-253.000.

Bednar, Gregory M.; and Fryer, George B., to International Business Machines Corp. (IBM). Method and apparatus for segmenting character images. 4,562,594, Cl. 382-9.000.

Beebe, Donald E. Wear protector for tooth brackets on roadway surface cutting machines. 4,561,698, Cl. 299-86.000.

Beecham Group p.l.c.: *See*—
Harbridge, John B.; and Stirling, Irene, 4,562,182, Cl. 514-210.000.

Behr, Raymond D.; and Zieke, Larry M., to Dow Chemical Company, The. Process for making cast thermoplastic film with integral closures. 4,562,027, Cl. 264-146.000.

Behrens, Martin; and Stoberl, Walter, to Siemens Aktiengesellschaft. Paper transportation device for printers which use reel paper, with one paper pressure roller. 4,561,792, Cl. 400-618.000.

Behringwerke Aktiengesellschaft: *See*—
Heimburger, Norbert; Kumpe, Gerhardt; Wormsbacher, Wilfried; and Preis, Hans M., 4,562,072, Cl. 424-101.000.

Belbel, Elie; Blanchard, Christian; Haury, Andre ; and Lauraire, Michel, to La Telemecanique Electrique. Switch device having an insulating screen inserted between the contacts during breaking and means for shearing the arc between this screen and an insulating wall. 4,562,323, Cl. 200-151.000.

Bele, Robert; and Micaletti, Gilbert, to CGR Ultrasonic. Image display process by ultrasounds from an alignment of transducer elements. 4,561,308, Cl. 73-626.000.

Bell, Curtis H.: *See*—
Olsen, Roy W.; and Bell, Curtis H., 4,561,838, Cl. 425-387.100.
Bell & Howell Company: *See*—
Svyatsky, Eduard; and Rabindran, K. George, 4,561,352, Cl. 101-2.000.
Bell, Jackie D.: *See*—
Fabbri, Vittorio E.; and Bell, Jackie D., 4,561,850, Cl. 434-98.000.
Bell, Michael S. Backpack for hikers. 4,561,578, Cl. 224-262.000.
Bellows, Kenneth O., to Air Preheater Company, Inc., The. Element basket assembly for heat exchanger. 4,561,492, Cl. 165-8.000.
Beloit Corporation: *See*—
Arav, Ronnie A., 4,561,379, Cl. 118-126.000.
Justus, Edgar J., 4,561,939, Cl. 162-360.100.
Bemis Company, Inc.: *See*—
Odom, Robert E., 4,561,238, Cl. 53-573.000.
Bendix, Roger J. Holder for paint brushes, rollers or the like. 4,561,556, Cl. 220-90.000.
Beneteau, Christian, to Champion Spark Plug Europe S.A. Wiper blade with air deflecting device. 4,561,143, Cl. 15-250.420.
Benitez, Francisco M.: *See*—
Small, Augustus B.; Hughes, Vincent L.; and Benitez, Francisco M., 4,562,233, Cl. 526-76.000.
Benson, Lee, to Overseas Promotions Ltd. Disc camera drive. 4,561,743, Cl. 354-121.000.
Benz, Frank J.; Shaw, Randall C.; and Dixon, David S., to United States of America, National Aeronautics and Space Administration. Device and method for frictionally testing materials for ignitability. 4,561,784, Cl. 374-8.000.
Berchem, Rutger, to Berchem & Schaberg GmbH. Method of making forged steel articles, especially for vehicle parts. 4,561,908, Cl. 148-12.00F.
Berchem & Schaberg GmbH: *See*—
Berchem, Rutger, 4,561,908, Cl. 148-12.00F.
Berdanier, Barry N.: *See*—
Patrick, Thomas R.; Powell, Richard; and Berdanier, Barry N., 4,561,775, Cl. 356-5.000.
Berenbaum, Alan D.; Jagannathan, Anand; Molinelli, John J.; and Pekarich, Steven P., to AT&T Bell Laboratories. Microprocessor having decision pointer to process restore position. 4,562,538, Cl. 364-200.000.
Beretta, Guiliano; and Saitto, Antonio, to Agence Spatiale Europeenne-European Space Agency. Orbital spacecraft having common main reflector and plural frequency selective subreflectors. 4,562,441, Cl. 343-781.00P.
Berges, Hanns-Peter; and Kabelitz, Hans-Peter, to Leybold-Heraeus. Method of producing a rotor for rotary slide-vane vacuum pumps, and a rotor produced by said method. 4,561,837, Cl. 418-255.000.
Berke, Joseph J.; and Michael, Charles T., to Berke, Joseph J. Elongated needle electrode and method of making same. 4,561,445, Cl. 128-642.000.
Berkey, George E., to Corning Glass Works. Method of making polarization preserving optical fiber. 4,561,871, Cl. 65-3.110.
Bernal Rotary Systems, Inc.: *See*—
Sarka, Albert J., 4,561,334, Cl. 83-27.000.
Bernard, Clay, II: *See*—
Matheny, William F., III; Bernard, Clay, II; and Angell, William M., 4,561,820, Cl. 414-331.000.
Bernard, Jacques; Rovel, Jean-Marie; Nicol, Roger; and Prevot, Claude, to Degremont. Apparatus for the anaerobic filtration of waste water. 4,561,974, Cl. 210-151.000.
Berner, Paul C., Jr.; and Brickman, Eugene L., to Vetco Offshore, Inc. Tubing suspension system. 4,561,499, Cl. 166-85.000.
Berstein, Garri, to Wilhelm Hegenscheidt Gesellschaft mbH. Method of deep-rolling crankshafts. 4,561,276, Cl. 72-81.000.
Berthet, Pierre: *See*—
Bricot, Claude; Berthet, Pierre; and Gerard, Jean-Louis, 4,562,564, Cl. 369-44.000.
Berthonnier, Jean-Yves: *See*—
Badon, Aime ; Berthonnier, Jean-Yves; and Mounier, Claude, 4,562,319, Cl. 200-144.0AP.
Bertiller, Roland; Kellner, Gerd; and Peter, Bernhard, to Mauser-Werke Oberndorf GmbH. Two-barrel revolver-type firearm. 4,561,340, Cl. 89-127.000.
Bertus, Brent J.; and McKay, Dwight L., to Phillips Petroleum Company. Liquid treating agent for cracking catalyst. 4,562,167, Cl. 502-100.000.
Besecke, Siegmund; and Schroder, Gunter, to Rohm GmbH Chemische Fabrik. Process for preparing cross-linked acrylic elastomers. 4,562,234, Cl. 526-241.000.
Besier, Horst-Erich: *See*—
Andra, Klaus; Hutschenruter, Elfriede; and Besier, Horst-Erich, 4,562,101, Cl. 428-36.000.
Besson, Raymond J.; Boy, Jean-Jacques; and Valentin, Jean-Pascal, to Schlumberger Technology Corporation. Piezoelectric transducer, notably for pressure measurement. 4,562,375, Cl. 310-338.000.
Betz Laboratories, Inc.: *See*—
Davis, Dwight P.; and Doherty, Francis G., 4,561,983, Cl. 210-755.000.
Beyeler, Harry: *See*—
Darms, Roland; Beyeler, Harry; and Haug, Theobald, 4,562,119, Cl. 428-458.000.
Bezard, Jean-Yves L. N.; Brocard, Jean-Marie; and Parisel, Christian A. F., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Servo valve control device. 4,561,470, Cl. 137-625.610.
Bhatia, Vinay K., to F. L. Smidth & Co. A/S. Treatment of flue gas. 4,562,054, Cl. 423-244.000.
Bhatti, Mohinder S., to Owens-Corning Fiberglas Corporation. Method of making glass fiber forming feeders. 4,561,870, Cl. 65-1.000.
Biferno, Michael A., to McDonnell Douglas Corporation. Fail transparent LCD display. 4,562,433, Cl. 340-716.000.
Bilimoria, Bomi M.: *See*—
Cook, Jerry A.; Garner, Robert H.; Turner, Ralph E., Jr.; and Bilimoria, Bomi M., 4,561,597, Cl. 241-17.000.
Billcon Co., Ltd.: *See*—
Sasaki, Tsutomu, 4,561,457, Cl. 133-3.00G.
Binge, Derek S.: *See*—
Olikara, Philip; and Binge, Derek S., 4,561,614, Cl. 244-173.000.
Bingham, Lawrence K.: *See*—
Sutch, George T., 4,561,194, Cl. 34-229.000.
Binion, W. Sidney. Reticle display for small arms. 4,561,204, Cl. 42-1.0ST.
Biochemie Gesellschaft m.b.H.: *See*—
Prager, Bernhard C.; Punk, Peter; and Thaler, Heinrich, 4,562,253, Cl. 544-19.000.
Biostim, Inc.: *See*—
Ferreira, Lloyd A.; and Mannheimer, Jeffrey S., 4,561,851, Cl. 434-272.000.
Biotronics: *See*—
Hofmann, Gunter A., 4,561,961, Cl. 204-299.00R.
BIP Chemicals Limited: *See*—
Carter, Moira A.; and Barrell, Kenneth, 4,562,215, Cl. 523-220.000.
Bishop, Arthur E.; and Baxter, John, to Bishop, Arthur E. Control valve for vehicle power steering systems. 4,561,516, Cl. 180-142.000.
Bishop, David C.; and Lawrence, Gordon L., to Matburn (Holdings) Limited. Thrombectomy catheter. 4,561,439, Cl. 128-348.100.
Bitrolf, Ehrenfried: *See*—
Bonnet, Ludwig; and Bitrolf, Ehrenfried, 4,561,438, Cl. 128-328.000.
Bituma-Stor, Inc.: *See*—
Dillman, Bruce, 4,561,821, Cl. 414-332.000.
Black & Decker Inc.: *See*—
Alessio, Lorenzo E., 4,561,674, Cl. 280-655.000.
Cook, Glyn F., 4,561,239, Cl. 56-320.100.
Black, John W., to Pemco-Kalamazoo, Inc. Mold opening device. 4,561,626, Cl. 249-118.000.
Black, William B., to Celanese Corporation. Self-crimping polyester yarn. 4,562,029, Cl. 264-167.000.
Blanchard, Christian: *See*—
Belbel, Elie; Blanchard, Christian; Haury, Andre ; and Lauraire, Michel, 4,562,323, Cl. 200-151.000.
Blanchard, Raymond A., Jr., to SCM Corporation. Automatic work correcting system. 4,561,793, Cl. 400-697.100.
Blarcom, David V.: *See*—
Rubin, Fred K.; Blarcom, David V.; and Fox, Daniel J., 4,561,994, Cl. 252-187.230.
Blasey, Dennis R. Solar parabolic collector. 4,561,423, Cl. 126-425.000.
Blaul, Ronald L., to Trigent, Inc. Method of solvent spray cleaning in an enclosed chamber. 4,561,903, Cl. 134-10.000.
Blazic, Oscar: *See*—
Guagliumi, Renato; and Blazic, Oscar, 4,561,296, Cl. 73-118.000.
Blohm, Knud; and Petersen, Hans P. B., to Danfoss A/S. Pneumatic setting device. 4,561,345, Cl. 91-459.000.
Blohm & Voss AG: *See*—
Franz, Hans-Joachim; Sadler, Karl-Otto; and Schmidt, Willi, 4,561,372, Cl. 114-74.00R.
Blythe, Michael P.: *See*—
Loyzim, Robert J.; and Blythe, Michael P., 4,562,393, Cl. 318-599.000.
Board of Regents: *See*—
Weldon, William F.; Gully, John H.; and Walls, William A., 4,562,368, Cl. 310-178.000.
Bogentoft, Conny B.: *See*—
Appelgren, Curt H.; Bogentoft, Conny B.; and Ekenved, Gunnar H., 4,562,061, Cl. 424-32.000.
Bohl, Thomas L., to Babcock & Wilcox Company, The. On-line coal analyzer. 4,562,044, Cl. 422-64.000.
Bohm, Heinrich: *See*—
Rieber, Norbert; Bohm, Heinrich; Platz, Rolf; and Fuchs, Werner, 4,562,262, Cl. 548-257.000.
Bolger, Thomas V., to RCA Corporation. Analog-to-digital conversion apparatus including a circuit to substitute calculated values when the dynamic range of the converter is exceeded. 4,562,456, Cl. 358-13.000.
Bolongeat-Mobleu, Roger; Busin, Thierry; and Ravet, Jean-Paul, to Merlin Gerin. Guiding assembly for a high-voltage circuit-breaker operating rod. 4,562,321, Cl. 200-148.00A.
Bolz, Ludwig; and Ruhle, Walter, to Robert Bosch GmbH. Starter for internal combustion engines. 4,561,316, Cl. 74-7.00E.
Bom, Cornelis J. G.: *See*—
van der Lely, Ary; and Bom, Cornelis J. G., 4,561,595, Cl. 239-687.000.
Bond, Charles R., to Verbatim Corporation. Disk drive alignment analyzer. 4,562,494, Cl. 360-75.000.
Bond, Charles R.; and Sturtevant-Stuart, Ronald M., to Verbatim Corporation. Multiple system disk. 4,562,495, Cl. 360-78.000.
Bonitz, Jorg; Entenmann, Robert; Killi, Geza; Knab, Rochus; Miller, Bernhard; Rohde, Siegfried; and Viess, Walter, to Robert Bosch GmbH. Cyclical reset of vehicular microcomputers for economic error immunity. 4,562,544, Cl. 364-431.110.
Bonne, Ulrich, to Honeywell Inc. Refrigeration or heat pump system defrost. 4,561,263, Cl. 62-176.200.

Bonnet, Ludwig; and Bitrolf, Ehrenfried, to Richard Wolf GmbH. Piezoelectric transducer with curved shafts. 4,561,438, Cl. 128-328.000.

Bonuchi, James A.; and Criscione, Frank J., II, to Simon-Johnson, Inc. Machine for pulling viscera package from fowls. 4,561,148, Cl. 17-11.000.

Booker, Scott E., to International Business Machines Corporation. Pivoting driver with changeable bits. 4,561,506, Cl. 173-39.000.

Bordon, Ernesto E., to Schlumberger Technology Corporation. Explosive charge safe-arming system. 4,561,356, Cl. 102-202.100.

Borg-Warner Corporation: *See—*
Fogelberg, Mark J., 4,561,520, Cl. 180-247.000.
Jenkins, Patrick A., 4,561,408, Cl. 123-571.000.
McIntosh, Arthur M., 4,561,529, Cl. 192-56.00R.

Borne, Andre ; and Heng, Jean-Paul, to CGEE ALSTHOM. Versatile electric connector. 4,561,712, Cl. 339-33.000.

Borsig GmbH: *See—*
Kehrer, Wolfgang, 4,561,496, Cl. 165-103.000.

Bostrom, Mark W., to Harris Corporation. Vacuum grip device. 4,561,687, Cl. 294-64.100.

Bostwick Doors (UK) Ltd.: *See—*
Calvert, Eric F., 4,561,483, Cl. 160-159.000.

Bottasso, Franco: *See—*
Tavazza, Giuseppe; and Bottasso, Franco, 4,561,482, Cl. 152-381.400.

Bottenbruch, Ludwig: *See—*
Rauleder, Gebhard; Waldmann, Helmut; Bottenbruch, Ludwig; Traenckner, Hans-Joachim; and Gau, Wolfgang, 4,562,274, Cl. 549-525.000.

Bourset, Claude; and Wajs, Georges, to Essilor International "Cie Generale d'Optique" . Contact lens. 4,561,737, Cl. 351-160.00R.

Bovermann, Klaus-Dieter, to Rittal-Werk Rudolf Loh GmbH & Co. KG. Subrack for electronic modules, particularly printed circuit boards. 4,561,710, Cl. 339-17.00M.

Bowen, Chester O.: *See—*
Hays, George E.; Nielsen, Richard H.; Bowen, Chester O.; and Holland, Floyd H., 4,562,046, Cl. 422-140.000.

Boy, Jean-Jacques: *See—*
Besson, Raymond J.; Boy, Jean-Jacques; and Valentin, Jean-Pascal, 4,562,375, Cl. 310-338.000.

Boyer, Robert: *See—*
Eouzan, Jean Y.; and Boyer, Robert, 4,562,471, Cl. 358-172.000.

Boykin, Otis F.: *See—*
Holmes, Curtis L.; Faber, William M., Sr.; Francis, Gaylord L.; and Boykin, Otis F., 4,561,996, Cl. 252-514.000.

Bradley, John, to , ..C Corporation. Linear peristaltic pump. 4,561,830, Cl. 417-474.000.

Bradley, William C., to Itek Corporation. Data compression apparatus and method for encoding and decoding multi-line signals. 4,562,467, Cl. 358-135.000.

Brandes, Wilhelm: *See—*
Elbe, Hans-Ludwig; Jautelat, Manfred; Buchel, Karl H.; Brandes, Wilhelm; Hanssler, Gerd; and Reinecke, Paul, 4,562,198, Cl. 514-383.000.
Kuhle, Engelbert; Paulus, Wilfried; Genth, Hermann; Brandes, Wilhelm; and Reinecke, Paul, 4,562,208, Cl. 514-593.000.

Brandrup, Johannes: *See—*
Busch, Wolfram; Brandrup, Johannes; and Fleischer, Dietrich, 4,562,224, Cl. 524-519.000.

Brandt, Daniel, to United States of America, Energy. Gas shielding apparatus. 4,562,334, Cl. 219-74.000.

Bressand, Rene: *See—*
Pascal, Roger; and Bressand, Rene, 4,561,673, Cl. 280-629.000.

Bresson, Clarence R.; Parlman, Robert M.; and Kimble, James B., to Phillips Petroleum Company. Trithiocarbonate flotation reagents. 4,561,984, Cl. 252-61.000.

Bresson, Clarence R.: *See—*
Kimble, Kenneth B.; and Bresson, Clarence R., 4,561,971, Cl. 209-166.000.

Brickman, Eugene L.: *See—*
Berner, Paul C., Jr.; and Brickman, Eugene L., 4,561,499, Cl. 166-85.000.

Bricot, Claude; Berthet, Pierre; and Gerard, Jean-Louis, to Thomson-CSF. Process and optical device for generating signals controlling the position of a scanning spot of the tracks of a data carrier. 4,562,564, Cl. 369-44.000.

Briggs & Stratton Corp.: *See—*
Spreng, Robert R., 4,561,270, Cl. 70-364.00R.

Brinkmann, Hans: *See—*
Pabst, Horst; and Brinkmann, Hans, 4,562,023, Cl. 264-75.000.

Briscoe, Terry L.; and Van Hoomissen, Robert L., to ESCO Corporation. Wedge-type rope socket connection and method. 4,561,154, Cl. 24-136.00K.

Bristol-Myers Co.: *See—*
Speer, Robert J.; and Stewart, David P., 4,562,275, Cl. 556-7.000.

British Telecommunications: *See—*
Clapp, Craig S. K.; Shilston, Norman L.; Jolivet, Jean-Claude R.; Devimeux, Daniel P.; and Riou, Armand, 4,562,466, Cl. 358-133.000.

Broberg, Berndt F. J.; and Evers, Hans C. A., to Astra Lakemedel Aktiebolag. Local anesthetic mixture for topical application, process for its preparation, as well as method for obtaining local anesthesia. 4,562,060, Cl. 424-28.000.

Brocard, Jean-Marie: *See—*
Bezard, Jean-Yves L. N.; Brocard, Jean-Marie; and Parisel, Christian A. F., 4,561,470, Cl. 137-625.610.

Brockway, Brock F.; Moretti, Anthony L.; Pellolio, Anselmo P.; and Rasmussen, Jimmie, to E. D. Bullard Company. Method of making loose fitting supplied air respiration hood. 4,561,162, Cl. 29-428.000.

Brodbeck, Howard D.; and Krongold, Martin A., to MG Industries. Gravity-fed low pressure cryogenic liquid delivery system. 4,561,258, Cl. 62-49.000.

Brogardh, Torgny; Hok, Bertil; and Ovren, Christer, to ASEA Aktiebolag. Fiber optical luminescence measuring system for measuring physical quantities with time- or frequency-divided signal information. 4,562,348, Cl. 250-231.00R.

Bromley, Charles W. A.: *See—*
Coombes, Norman A.; Wilkinson, Michael R.; and Bromley, Charles W. A., 4,562,226, Cl. 524-767.000.

Brouard, Rene A.; and Tracez, Jean C., to Ceca S.A. Use of novel amines as bases for the preparation of emulsions of hydrocarbon binders. 4,561,900, Cl. 106-246.000.

Brown, Edric M. E.: *See—*
Corbett, John; Brown, Edric M. E.; Tapner, Peter N.; and Commander, David J., 4,561,367, Cl. 112-38.000.

Brown, Harold M.: *See—*
Owen, Jeffrey D.; and Brown, Harold M., 4,561,963, Cl. 204-433.000.

Brown, Luba. Stitchery needle board. 4,561,574, Cl. 223-109.00R.

Brown, Omar L.: *See—*
Bachmann, Henry C.; Brown, Omar L.; Fraze, Ermal C.; Gregg, James R.; and Wynn, David K., 4,561,280, Cl. 72-346.000.

Brown, Robert L. Computerized executive work station. 4,562,482, Cl. 358-254.000.

Brownbill, George A.; and Olsen, James E., to Koehring Company. Sectional valve having dual pressure relief. 4,561,463, Cl. 137-596.130.

Brownlie, Alan; Crawford, Jeffrey D.; and Smith, Harold A., to Knoll International, Inc. Back support tilt and seat and back support height control mechanism for a chair or the like. 4,561,693, Cl. 297-306.000.

Bruggemann, Ulrich: *See—*
Rub, Walter; and Bruggemann, Ulrich, 4,562,395, Cl. 318-696.000.

Brunet, Maurice: *See—*
Habermann, Helmut; and Brunet, Maurice, 4,561,313, Cl. 73-862.070.

Brush, Robert W., Jr.; and Waghorn, Robert D., to Allied Corporation. Method for electrical connection to the center conductor of an insulated wire. 4,561,179, Cl. 29-866.000.

Bruzzese, Tiberio; Dell'Acqua, Ernani; and Van Den Heuvel, Holger H., to SPA Societa Prodotti Antibiotici S.p.A. Rifamycins derivatives and preparation and pharmaceutical compositions thereof. 4,562,203, Cl. 514-468.000.

Bryant, George M.: *See—*
Walter, Andrew T.; Bryant, George M.; and Readshaw, Ronald L., 4,562,097, Cl. 427-209.000.

Bryant, Gordon H., to United States of America, Army. Electrolytic pressure transduction system. 4,561,450, Cl. 128-780.000.

Buchas, Gerald L., to Colen-Kery, Inc. Apparatus for sensing and recording biopotential electrical signals. 4,561,448, Cl. 128-733.000.

Buchel, Karl H.: *See—*
Elbe, Hans-Ludwig; Jautelat, Manfred; Buchel, Karl H.; Brandes, Wilhelm; Hanssler, Gerd; and Reinecke, Paul, 4,562,198, Cl. 514-383.000.

Buchschmid, Emil; Gademann, Lothar; Hirt, Adam; Huttinger, Manfred; Jahn, Hans P.; Orova, Josef; Schmid, Hans-Dieter; and Steffen, Horst-Gunter, to Robert Bosch GmbH. Magneto ignition unit with control circuit potted together with the armature windings, for internal combustion engines. 4,561,410, Cl. 123-599.000.

Buehl, George T.: *See—*
Mischenko, Peter S.; and Buehl, George T., 4,561,142, Cl. 15-97.00R.

Buhagiar, Francois: *See—*
Le Creff, Michel; Guillou, Francoise; and Buhagiar, Francois, 4,562,309, Cl. 179-90.00R.

Bullard, Harold L.: *See—*
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Bullock, Robert J.: *See—*
Robillard, David R.; Bullock, Robert J.; and Marino, Jerry C., 4,561,619, Cl. 248-285.000.

Bumgardner, Dewey; and Marple, Julian, Jr. Toilet seat cover safety latch. 4,561,130, Cl. 4-253.000.

Bunkoczy, Bela, to Garrett Corporation, The. Toroidal pressure vessel. 4,561,476, Cl. 141-311.00R.

Burdine, Charles M. Mechanical wood splitter. 4,561,479, Cl. 144-193.00B.

Burger, Horst. Nozzle arrangement for a vehicle drying installation. 4,561,193, Cl. 34-54.000.

Burgess, Robert G., to Radiation Dynamics, Inc. Apparatus for conveying articles through an irradiation beam. 4,561,358, Cl. 104-89.000.

Burns, Lynn V. Method and harvester attachment for stabilizing grapevines during harvesting. 4,561,241, Cl. 56-330.000.

Burns, Peter: *See—*
Atherton, Paul; Burns, Peter; and Green, Brian N., 4,562,351, Cl. 250-288.000.

Burroughs Corporation: *See—*
Abel, Kenneth N.; and Dunn, Gerald R., 4,561,586, Cl. 228-264.000.
Hazel, Robert L.; and Chan, Gilbert Y., 4,562,568, Cl. 369-112.000.

Bursztejn, Jacques; and Babany, Lucien, to Thomson-CSF. Transmitter-receiver station having low power consumption for a two-way communication link. 4,562,307, Cl. 179-2.00E.

Busch, Wolfram; Brandrup, Johannes; and Fleischer, Dietrich, to Hoechst Aktiengesellschaft. Chloropolyethylene, process for the manufacture thereof and its use. 4,562,224, Cl. 524-519.000.
Busin, Thierry: *See*—
Bolongeat-Mobleu, Roger; Busin, Thierry; and Ravet, Jean-Paul, 4,562,321, Cl. 200-148.00A.
Butler, Donald E.; and L'Italien, Yvon J., to Warner-Lambert Company. Reversing amnesia with saturated tricyclic nitrogen-containing diones. 4,562,195, Cl. 514-294.000.
Butler Manufacturing Company: *See*—
Harter, James W.; and Smagiel, Gary S., 4,561,233, Cl. 52-588.000.
Buttermann, Garry G., III. Method of making an ice cream sundae. 4,562,081, Cl. 426-101.000.
Byczek, Roger W.; and Wurz, Norman R., to Bally Midway Mfg. Co. Contact assembly for ribbon cable. 4,561,714, Cl. 339-97.00P.
Bygdnes, Perry A., to Tandon Corporation. Mechanism for latching magnetic disk memory head/arm assembly in parking zone. 4,562,500, Cl. 360-105.000.
C. R. Bard: *See*—
Allen, Douglas, Jr.; and Flam, Eric, 4,561,858, Cl. 604-336.000.
C. van der Lely N.V.: *See*—
van der Lely, Ary; and Bom, Cornelis J. G., 4,561,595, Cl. 239-687.000.
Cabot Corporation: *See*—
Kumar, Prabhat; and Anand, Vidhu, 4,561,892, Cl. 75-251.000.
Cadbury Schweppes, PLC: *See*—
Jeans, Edward L., 4,562,013, Cl. 261-50.00B.
Cairns & Brother Inc.: *See*—
Ehring, Carolyn C.; and Baumgartner, Edward W., 4,561,121, Cl. 2-2.000.
Cairns, Gordon. Barbecue grill. 4,561,418, Cl. 126-41.00R.
Calder, Iain D.; and Naguib, Hussein M., to Northern Telecom Limited. Laser activated polysilicon connections for redundancy. 4,561,906, Cl. 148-1.500.
Calgon Corporation: *See*—
Zupanovich, John D.; and Myers, John G., 4,561,897, Cl. 106-14.140.
California Artichoke and Vegetable Growers Corp.: *See*—
Tonus, Egidio L., 4,561,234, Cl. 53-399.000.
California Biotechnology, Inc.: *See*—
Lewicki, John, 4,562,003, Cl. 260-112.00B.
California Institute of Technology: *See*—
Yariv, Amnon; Harder, Christoph; and Lau, Kam-Yin, 4,562,569, Cl. 369-122.000.
Call, Daniel D., to Oy Fiskars AB. Knife holder with frontal slots. 4,561,548, Cl. 211-70.700.
Calmar, Inc.: *See*—
Reeve, Randy F., 4,561,544, Cl. 206-540.000.
Calvert, Eric F., to Bostwick Doors (UK) Ltd. Guide track for a folding barrier. 4,561,483, Cl. 160-159.000.
Calvert, Robert W., to Cessna Aircraft Company, The. Series self-leveling valve. 4,561,342, Cl. 91-31.000.
Cammack, Michael A.; and Smith, David W., to Teledyne Industries, Inc. Showerhead. 4,561,593, Cl. 239-600.000.
Campbell, Charles: *See*—
Humphrey, William E.; and Campbell, Charles, 4,561,738, Cl. 351-226.000.
Campbell, Henry F.: *See*—
Kuhla, Donald E.; Studt, William L.; Campbell, Henry F.; and Yelnosky, John, 4,562,188, Cl. 514-245.000.
Campo, Juan J., to Babcock & Wilcox Company, The. Assembly of conductor guides for offshore drilling platform. 4,561,802, Cl. 405-195.000.
Campo, Juan J.; and Crutti, John A., Sr., to McDermott International, Inc. Conductor guide system for offshore drilling platform. 4,561,803, Cl. 405-224.000.
Canada, Her Majesty the Queen in Right of, as represented by the Minister of Natural Resources: *See*—
Novak, Milan, 4,561,207, Cl. 43-87.000.
Canon Kabushiki Kaisha: *See*—
Aoki, Tomohiro; and Tanaka, Hidetoshi, 4,561,767, Cl. 355-26.000.
Hotta, Yoshio, 4,561,725, Cl. 350-341.000.
Maeshima, Katsuyoshi, 4,562,485, Cl. 358-280.000.
Masuda, Shunichi, 4,561,765, Cl. 355-14.0SH.
Matsumura, Susumu, 4,561,750, Cl. 354-406.000.
Matsuyama, Shinichi, 4,561,754, Cl. 354-484.000.
Sato, Hiroshi, 4,561,773, Cl. 355-43.000.
Tsutsui, Shinji, 4,561,688, Cl. 294-64.100.
Cantwell, Gill. Transducer support apparatus. 4,562,501, Cl. 360-109.000.
Capps, Ernest R., to Royster Company, The. Apparatus for handling blended dry particulate materials. 4,561,818, Cl. 414-301.000.
Cardiff, Raymond S., to Cardiff's Pty Ltd. Air circulation system. 4,561,265, Cl. 62-419.000.
Cardiff's Pty Ltd.: *See*—
Cardiff, Raymond S., 4,561,265, Cl. 62-419.000.
Cari-All Inc.: *See*—
Trubiano, Antoine, 4,561,676, Cl. 280-801.000.
Carl-Zeiss-Stiftung: *See*—
Furter, Gerhard; and Lahres, Hans, 4,561,736, Cl. 351-159.000.
Carlingswitch, Inc.: *See*—
Sorenson, Richard W., 4,562,318, Cl. 200-73.000.
Carlow, Charles A., to National Research Development Corp. Sorting conveyor. 4,561,545, Cl. 209-564.000.
Carlson, David J., to RCA Corporation. Double conversion tuner with split IF output. 4,562,472, Cl. 358-197.000.
Carmichael, Richard Q.: *See*—
Gulley, Brian W.; Williamson, Gilbert J.; Carmichael, Richard Q.; Cooke, David F.; and Taylor, Roderick, 4,561,860, Cl. 44-10.00R.
Carpenter, James H.; Mullins, Ronald L.; and Smith, Ronald L., to Kennecott Corporation. Portable abrasive throwing wheel device. 4,561,220, Cl. 51-427.000.
Carruthers, James D.: *See*—
Beck, H. Wayne; Carruthers, James D.; Cornelius, Edward B.; Kmecak, Ronald A.; Kovach, Stephen M.; and Hettinger, William P., Jr., 4,561,968, Cl. 208-120.000.
Carter, Moira A.; and Barrell, Kenneth, to BIP Chemicals Limited. Filled thermoplastics. 4,562,215, Cl. 523-220.000.
Cashmere, Raymond A., to Luckit Pty. Limited. Toboggan. 4,561,664, Cl. 280-18.000.
Casio Computer Co., Ltd.: *See*—
Hirasawa, Yukinori; and Kameda, Osamu, 4,562,478, Cl. 358-236.000.
Ohno, Hiroko, 4,561,338, Cl. 84-1.030.
Cavalier, Robert G.; Cordi, Alexis A.; Gillet, Claude L.; Janssens de Varebeke, Philippe M.; Niebes, Paul J.; Roba, Joseph L.; Van Dorsser, William R.; Lambelin, Georges E.; and Franz, Michel R., to Continental Pharma Inc. Derivatives of 2-aminoacetic acid. 4,562,205, Cl. 514-546.000.
Ceca S.A.: *See*—
Brouard, Rene A.; and Tracez, Jean C., 4,561,900, Cl. 106-246.000.
Celanese Corporation: *See*—
Black, William B., 4,562,029, Cl. 264-167.000.
Trail, George C., Jr., 4,561,580, Cl. 226-45.000.
Yoon, Hyun-Nam, 4,562,244, Cl. 528-190.000.
Cemedine Co., Ltd.: *See*—
Okuno, Eiichi; Okamura, Naomi; and Saitoh, Takashi, 4,562,237, Cl. 528-17.000.
Centre de Recherche Industrielle du Quebec: *See*—
Dinh, Chom T. L.; Garceau, Roger; Pastor, Marc; and Terreault, Gerard, 4,562,470, Cl. 358-167.000.
Ceraver, S.A.: *See*—
Alary, Jean-Andre ; Cot, Louis; Gugliermotte, Francis; Larbot, Andre ; and Guizard, Christian, 4,562,021, Cl. 264-43.000.
Cessna Aircraft Company, The: *See*—
Calvert, Robert W., 4,561,342, Cl. 91-31.000.
CGEE ALSTHOM: *See*—
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CGR Ultrasonic: *See*—
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Chainer, Timothy J.; and Worthington, Thomas K., to International Business Machines Corporation. Shifting technique for signature verification. 4,562,592, Cl. 382-3.000.
Chaki, Takao: *See*—
Okamoto, Kazuhiko; and Chaki, Takao, 4,561,317, Cl. 74-10.330.
Chambron, Edmond: *See*—
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Champion International Corporation: *See*—
Wysocki, Lawrence S., 4,561,587, Cl. 229-36.000.
Champion Spark Plug Company: *See*—
Freeman, Frederick O., 4,561,624, Cl. 248-639.000.
Champion Spark Plug Europe S.A.: *See*—
Beneteau, Christian, 4,561,143, Cl. 15-250.420.
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Chandra, Rangasami S.: *See*—
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Chang, Ding; Arimura, Akira; Culler, Michael D.; and Chang, Jaw-Kang. Synthetic peptides. 4,562,175, Cl. 514-12.000.
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Chang, Ding; Arimura, Akira; Culler, Michael D.; and Chang, Jaw-Kang, 4,562,175, Cl. 514-12.000.
Chapman, David: *See*—
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Chapman, Earle F. Floor lamp. 4,562,520, Cl. 362-414.000.
Chapman, Richard H.; and Sams, Bernard, to Pneumatic Rubber Stamp Co., Ltd. Endless band hand stamp. 4,561,353, Cl. 101-111.000.
Characklis, William G. Treatment of fouling with microcapsules. 4,561,981, Cl. 210-696.000.
Charbonnel, Jean-Louis, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.". Apparatus for separating a liquid from a gas, particularly for turboengine bearing cases. 4,561,867, Cl. 55-202.000.
Chari, Venu: *See*—
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Charlat, Patrice: *See*—
Mallen-Herrero, Jose ; Leroy, Daniel; Zimmermann, Urs; and Charlat, Patrice, 4,561,831, Cl. 418-28.000.
Chas. Chapman Company Limited, The: *See*—
Shepherd, Charles G.; and Chapman, David, 4,561,623, Cl. 248-447.000.
Charpentier, Albert J.: *See*—
Redfield, James W.; and Charpentier, Albert J., 4,561,659, Cl. 273-313.000.
Chartrain, Armand N.; and Genne, Lee A. Storage battery cover. 4,562,126, Cl. 429-72.000.
Chastain, Edward H. Illuminating spinner. 4,562,516, Cl. 362-78.000.

Checkland, John A.; and Woytiuk, Leo V., to Northern Telecom Limited. Inside telecommunication cable. 4,562,302, Cl. 174-118.000.
Chemex Pharmaceuticals, Inc.: *See*—
Parkhurst, Robert M.; and Pardini, Ronald S., 4,562,298, Cl. 568-644.000.
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Chen, Augustin T.; Onder, Kemal; and Rausch, Karl W., Jr., to UpJohn Company, The. Polymer blends. 4,562,228, Cl. 525-66.000.
Chen, Chao-Yang. Pipe wrench. 4,561,330, Cl. 81-129.500.
Chen, Jason K. S. Washing liquid supplier. 4,561,571, Cl. 222-207.000.
Chen, John; Huang, Chin; Graves, Nancy D.; and Hicks, James E., to RCA Corporation. Regulator fault protection circuit. 4,562,508, Cl. 361-91.000.
Chen, Ming-Tang. Barbecue oven. 4,561,417, Cl. 126-25.00A.
Chesebrough-Ponds, Inc.: *See*—
McKnight, James T.; and Silverstein, Paul, 4,561,435, Cl. 128-156.000.
Cheung, Yin L.: *See*—
Long, Stephen L.; and Cheung, Yin L., 4,561,785, Cl. 374-42.000.
Chevron Research Company: *See*—
King, William F., 4,562,180, Cl. 514-114.000.
Miller, Stephen J., 4,561,967, Cl. 208-120.000.
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Matsushima, Yoshiaki; Chiaki, Nobutaka; Kato, Kuniaki; and Horikiri, Toshihiko, 4,561,628, Cl. 251-30.010.
Chiba, Kazuhiko: *See*—
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Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizu, Susumu; Watanabe, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,561,877, Cl. 71-90.000.
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Chiyoda Chemical Engineering & Construction Co., Ltd.: *See*—
Asaoka, Sachio; Sendo, Takashi; and Nakamura, Munekazu, 4,562,059, Cl. 423-626.000.
Chloride Group Public Limited Company: *See*—
Humphreys, John K.; and Valentine, Joseph, 4,562,128, Cl. 429-178.000.
Chmelar, Mark A.: *See*—
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Choate, Thomas G. A., to Exxon Production Research Co. Seal pressure reduction system. 4,561,679, Cl. 285-95.000.
Choiniere, Gabriel: *See*—
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Chou, Billy J., to William H. Rorer, Inc. Promotion of feed efficiency in animals. 4,562,209, Cl. 514-596.000.
Chou, Wayne W.; and Erett, Richard E. Method and apparatus for protecting computer software utilizing an active coded hardware device. 4,562,306, Cl. 178-22.080.
Choy, Clement K.; and Sudbury, Barry A., to Clorox Company, The. Thixotropic acid-abrasive cleaner. 4,561,993, Cl. 252-174.250.
Chubb Australia Limited: *See*—
McCulloch, Alister L., 4,561,630, Cl. 251-84.000.
Chugai Ro Co., Ltd.: *See*—
Hatakenaka, Toshiki; Akiyama, Tetsuo; Asada, Shinji; and Shinohara, Kunio, 4,561,800, Cl. 404-79.000.
Chun, Kwang S.: *See*—
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Ciba-Geigy Corporation: *See*—
Balli, Heinz; Gunzenhauser, Sigmund; Fletcher, Ian J.; and Bedekovic, Davor, 4,562,449, Cl. 346-218.000.
Darms, Roland; Beyeler, Harry; and Haug, Theobald, 4,562,119, Cl. 428-458.000.
Meyer, Willy; and Fory, Werner, 4,561,878, Cl. 71-92.000.
Meyer, Willy; Topfl, Werner; Kristinsson, Haukur; and Eckhardt, Wolfgang, 4,562,210, Cl. 514-604.000.
Ramanathan, Visvanathan, 4,562,247, Cl. 534-605.000.
Renner, Alfred, 4,562,241, Cl. 528-99.000.
Schwander, Hansrudolf; and Hurter, Rudolf, 4,562,249, Cl. 534-641.000.
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Cibie Projecteurs: *See*—
Deves, Patrick, 4,562,519, Cl. 362-308.000.
Claire, Edward W.: *See*—
Dahlgren, William V., Jr.; and Claire, Edward W., 4,561,814, Cl. 409-80.000.
Clapp, Craig S. K.; Shilston, Norman L.; Jolivet, Jean-Claude R.; Devimeux, Daniel P.; and Riou, Armand, to British Telecommunications. Digital data transmission/reception having adaptive error control. 4,562,466, Cl. 358-133.000.
Clarenz, Werner: *See*—
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Clarion Co., Ltd.: *See*—
Asai, Ryuichi; Okamato, Takeshi; and Minagawa, Shoichi, 4,562,371, Cl. 310-313.00A.
Koyama, Reikichi; and Usugi, Kikuo, 4,562,488, Cl. 360-8.000.
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Clark, John M.: *See*—
Pugnale, Peter J.; Clark, John M.; and Penland, William R., 4,561,292, Cl. 73-49.200.
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Rose, Gene R., 4,561,247, Cl. 60-335.000.
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Clausen, Erik; and Clausen, Johannes, 4,561,720, Cl. 350-128.000.
Clausing, Don P., to Xerox Corporation. Sheet feeding and separating apparatus with stack force relief/enhancement. 4,561,644, Cl. 271-34.000.
Clayton, John C.: *See*—
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Cleland, Keith B. Ore concentrator pad assembly. 4,561,973, Cl. 209-434.000.
Clement, Donald E.: *See*—
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Cline, Harvey E.: *See*—
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Clorox Company, The: *See*—
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Coal Industry (Patents) Ltd.: *See*—
Wilson, James; and McCaffrey, David J. A., 4,562,165, Cl. 502-33.000.
Coard, Floyd A., M.D.: *See*—
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Coburn Optical Industries, Inc.: *See*—
Tusinski, Joseph; Barnes, Brian R.; and Mathews, Herbert H., 4,561,213, Cl. 51-105.0LG.
Cochran, Michael J.: *See*—
Barnett, Howard S.; Cochran, Michael J.; and Poland, Sid, 4,562,537, Cl. 364-200.000.
Cochran, Ulrich D. Infusion pump. 4,561,856, Cl. 604-143.000.
Codex Corporation: *See*—
Forney, George D., Jr., 4,562,426, Cl. 340-347.0DD.
Humblet, Pierre A., 4,562,423, Cl. 340-347.0DD.
Cohen, Hyman: *See*—
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Coker, Geoffrey G.: *See*—
Findlay, John W. A.; and Coker, Geoffrey G., 4,562,258, Cl. 546-281.000.
Coker, Thomas G.; and La Conti, Anthony B., to United Technologies Corporation. Electrolysis of alkali metal salts with hydrogen depolarized anodes. 4,561,945, Cl. 204-98.000.
Colacello, Michael A.; Fitzke, Emil V.; and Otto, Jack F., to RCA Corporation. Method for heat sealing a gun mount in a CRT neck. 4,561,874, Cl. 65-36.000.
Coleco Industries, Inc.: *See*—
Amici, Francis R.; and Piazza, Pietro, 4,561,854, Cl. 446-304.000.
Coleman, Charles L.; and Rubin, Harvey, to AT&T Bell Laboratories. Data communication network. 4,562,436, Cl. 340-825.000.
Colen-Kery, Inc.: *See*—
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Colgate-Palmolive Company: *See*—
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Hayes, Harry; and Harvey, Kenneth, 4,562,065, Cl. 424-49.000.
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Misevich, Kenneth W., 4,561,197, Cl. 36-127.000.
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Colle, Karla S.: *See*—
Singhal, Gopal H.; Colle, Karla S.; Edelson, Edward H.; Wilson, Bobby L.; and Dao, Loan H., 4,561,964, Cl. 208-10.000.
Collins, Leslie M.; and Zarr, Myron, to Minnesota Mining and Manufacturing Company. Anti-friction and non-oscillating spool for belt driven cartridge. 4,561,609, Cl. 242-192.000.
Colliver, Anthony D., to F.F. Seeley Nominees Pty. Ltd. Evaporative air-conditioner water bleed-off system. 4,562,016, Cl. 261-106.000.
Colt Industries Operating Corp: *See*—
Johnson, Kalin S.; and Alsobrooks, Daniel E., 4,561,158, Cl. 29-156.40R.
Combustion Electromagnetics, Inc.: *See*—
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Comerford, Robert B.: *See*—
DeLorenzi, Benjamin; and Comerford, Robert B., 4,561,923, Cl. 156-350.000.
Comfort, John V.: *See*—
Parsons, David; Windsor, Harry M.; and Comfort, John V., 4,561,530, Cl. 192-0.076.
Commander, David J.: *See*—
Corbett, John; Brown, Edric M. E.; Tapner, Peter N.; and Commander, David J., 4,561,367, Cl. 112-38.000.
Commissariat a l'Energie Atomique: *See*—
de Villepoix, Raymond; Fages, Jean; Forges, Robert; Abbes, Claude; and Rouaud, Christian, 4,561,662, Cl. 277-229.000.
Plaige, Yves, 4,562,035, Cl. 376-215.000.
Commodore Business Machines, Inc.: *See*—
Redfield, James W.; and Charpentier, Albert J., 4,561,659, Cl. 273-313.000.

Redfield, James W., 4,562,365, Cl. 307-471.000.

Compagnie de Construction Mecanique Sulzer: *See—*
Mallen-Herrero, Jose ; Leroy, Daniel; Zimmermann, Urs; and Charlat, Patrice, 4,561,831, Cl. 418-28.000.

Compagnie Francaise des Petroles: *See—*
Quin, Rene ; Wiet, Paul; and Migliarese-Caputi, Jean-Louis, 4,561,248, Cl. 60-413.000.

Componentes Electronicos SA-C.S.A.: *See—*
Sansa, Jose V., 4,562,514, Cl. 361-433.000.

Conair Corporation: *See—*
Pajak, Witold, 4,561,455, Cl. 132-37.00R.

Concast Service Union AG: *See—*
Navarro, Carlos R., 4,561,490, Cl. 164-483.000.

Connor, David T.; and Sorenson, Roderick J., to Warner-Lambert Company. Cycloheptadiene derivatives. 4,562,006, Cl. 260-410.000.

Conrad, Marvin C.: *See—*
Vincent, Geoffrey P. F.; Ing-Simmons, Nicholas K. D.; McGrath, John; and Conrad, Marvin C., 4,562,535, Cl. 364-200.000.

Conti Fasteners AG: *See—*
Taubert, Hubert; and Webendoerfer, Rudolf, 4,561,277, Cl. 72-88.000.

Continental Conveyor & Equipment Co., Inc.: *See—*
Dos Santos, Joseph A., 4,561,537, Cl. 198-628.000.

Continental Pharma Inc.: *See—*
Cavalier, Robert G.; Cordi, Alexis A.; Gillet, Claude L.; Janssens de Varebeke, Philippe M.; Niebes, Paul J.; Roba, Joseph L.; Van Dorsser, William R.; Lambelin, Georges E.; and Franz, Michel R., 4,562,205, Cl. 514-546.000.

Continental Plastic Beverage Bottles, Inc.: *See—*
Miller, Bryan H., 4,561,555, Cl. 220-67.000.

Conway, John T.; and Albone, Robert C., to Monroe Electronics, Inc. Static event detector and tape probe. 4,562,429, Cl. 340-657.000.

Cook, Glyn F., to Black & Decker Inc. Pivotal handle mount. 4,561,239, Cl. 56-320.100.

Cook, Jerry A.; Garner, Robert H.; Turner, Ralph E., Jr.; and Bilimoria, Bomi M., to Anglo-American Clays Corp. Method for improving handleability of calcined kaolin clay products. 4,561,597, Cl. 241-17.000.

Cooke, David F.: *See—*
Gulley, Brian W.; Williamson, Gilbert J.; Carmichael, Richard Q.; Cooke, David F.; and Taylor, Roderick, 4,561,860, Cl. 44-10.00R.

Cooke, Roger E.: *See—*
Heeks, John S.; and Cooke, Roger E., 4,561,727, Cl. 350-351.000.

Coombes, Norman A.; Wilkinson, Michael R.; and Bromley, Charles W. A., to Imperial Chemical Industries PLC. Coating compositions. 4,562,226, Cl. 524-767.000.

Cooper Industries, Inc.: *See—*
Moran, Richard J., 4,562,506, Cl. 361-71.000.

Cooper LaserSonics, Inc.: *See—*
Munnerlyn, Charles R., 4,561,436, Cl. 128-303.100.

Corbett, John; Brown, Edric M. E.; Tapner, Peter N.; and Commander, David J., to USM Corporation. Lockstitch sewing machine. 4,561,367, Cl. 112-38.000.

Cordi, Alexis A.: *See—*
Cavalier, Robert G.; Cordi, Alexis A.; Gillet, Claude L.; Janssens de Varebeke, Philippe M.; Niebes, Paul J.; Roba, Joseph L.; Van Dorsser, William R.; Lambelin, Georges E.; and Franz, Michel R., 4,562,205, Cl. 514-546.000.

Cordis Corporation: *See—*
Livingston, John H.; and Yomtov, Barry M., 4,561,444, Cl. 128-419.0PG.
Vollmann, William; and Mumford, Van E., 4,561,442, Cl. 128-419.0PG.

Cornelius, Edward B.: *See—*
Beck, H. Wayne; Carruthers, James D.; Cornelius, Edward B.; Kmecak, Ronald A.; Kovach, Stephen M.; and Hettinger, William P., Jr., 4,561,968, Cl. 208-120.000.

Corning Glass Works: *See—*
Berkey, George E., 4,561,871, Cl. 65-3.110.
Luong, John C.; and Scherer, George W., 4,561,872, Cl. 65-18.100.
Quan, Frederic J-Y, 4,561,719, Cl. 350-96.210.

Cot, Louis: *See—*
Alary, Jean-Andre ; Cot, Louis; Gugliermotte, Francis; Larbot, Andre ; and Guizard, Christian, 4,562,021, Cl. 264-43.000.

Couche, Raymond A., to R. A. Couche & Associates Pty. Ltd. Screening device. 4,561,980, Cl. 210-486.000.

Coulon, Jean-Claude; and Douche, Jean-Pierre, to Saint Gobain Vitrage. Method and apparatus for manufacturing a uniformly coated substrate. 4,562,095, Cl. 427-180.000.

Coulter Systems Corporation: *See—*
Lawson, John A.; Kuehnle, Manfred R.; and Knox, Joseph D., 4,561,730, Cl. 350-432.000.

Courtenay, John H.; and Phillips, Royston J., to Foseco International Limited. Fluxes for casing metals. 4,561,912, Cl. 148-23.000.

Coutures, Jean-Louis: *See—*
Beal, Gerard; and Coutures, Jean-Louis, 4,562,417, Cl. 333-165.000.

Cox, Norman V. Fitting doctor blades. 4,561,163, Cl. 29-464.000.

Crane Co.: *See—*
Skarvada, Thomas, 4,562,542, Cl. 364-426.000.

Crawford, Jeffrey D.: *See—*
Brownlie, Alan; Crawford, Jeffrey D.; and Smith, Harold A., 4,561,693, Cl. 297-306.000.

Cremers, David A.: *See—*
Radziemski, Leon J.; and Cremers, David A., 4,561,777, Cl. 356-318.000.

Crisci, Clem C., to Northern Engineering and Plastics Corp. Snap on twist off tamper-proof closure for containers. 4,561,553, Cl. 215-256.000.

Criscione, Frank J., II: *See—*
Bonuchi, James A.; and Criscione, Frank J., II, 4,561,148, Cl. 17-11.000.

Crisp, Harold A.; and Clayton, John C., to Glaxo Group Limited. Amorphous form of cefuroxime ester. 4,562,181, Cl. 514-202.000.

Crosilla, Danilo A.: *See—*
Asselin, Andre A.; Crosilla, Danilo A.; and Humber, Leslie G., 4,562,200, Cl. 514-415.000.

Cross, Henry F.; and Harman, Maurice, to Energy Equipment Company, Ltd., The. Fluidized bed shell boilers. 4,561,385, Cl. 122-4.00D.

Crutti, John A., Sr.: *See—*
Campo, Juan J.; and Crutti, John A., Sr., 4,561,803, Cl. 405-224.000.

CTS Corporation: *See—*
Holmes, Curtis L.; Faber, William M., Sr.; Francis, Gaylord L.; and Boykin, Otis F., 4,561,996, Cl. 252-514.000.

Cuenoud, Gerard: *See—*
Moret, Michel-Antoine; Cuenoud, Gerard; and Jousson, Pierre-Jean, 4,561,251, Cl. 60-537.000.

Cuir, Gerard: *See—*
Cuir, Jean P.; and Cuir, Gerard, 4,561,355, Cl. 101-378.000.

Cuir, Jean P.; and Cuir, Gerard. Device for fixing a plate on a cylinder. 4,561,355, Cl. 101-378.000.

Culler, Michael D.: *See—*
Chang, Ding; Arimura, Akira; Culler, Michael D.; and Chang, Jaw-Kang, 4,562,175, Cl. 514-12.000.

Curtil, Remi, to Societe d'Etudes de Machines Thermiques SEMT. Method of operating supercharged diesel engine with modified valve lift and bypassed intake air. 4,561,253, Cl. 60-606.000.

Czech, Franz, to BBC Brown, Boveri & Company, Ltd. Disc-type insulator with a cast-in electrode and process for its manufacture. 4,562,303, Cl. 174-142.000.

Dabringhaus, Gustav H., to Gustav Dabringhaus Revocable Trust. Linear recirculating roller bearing assembly. 4,561,703, Cl. 308-6.00C.

Dagostino, Thomas P.: *See—*
Jones, Roydn; Dagostino, Thomas P.; and Navarro, Luis J., 4,562,363, Cl. 307-351.000.

Dahlgren, William V., Jr.; and Claire, Edward W. Mechanical tool manipulating method and apparatus. 4,561,814, Cl. 409-80.000.

Daicel Chemical Industries, Ltd.: *See—*
Hottori, Makoto; and Yamanaka, Shoji, 4,562,056, Cl. 423-351.000.
Koga, Kunio; Sasaki, Yukihiro; and Samejima, Mutsumi, 4,562,288, Cl. 562-608.000.

Daido Kogyo, Co., Ltd.: *See—*
Kawauchi, Kazunori; and Sato, Junichi, 4,561,481, Cl. 152-379.300.

Daikoku, Takahiro: *See—*
Nakajima, Tadakatsu; Nakayama, Wataru; Daikoku, Takahiro; Kuwahara, Heikichi; Yasukawa, Akira; Kasuya, Katsuhiko; Yokoi, Kazuaki; Nakae, Hideo; and Yoshida, Hiromichi, 4,561,497, Cl. 165-133.000.

Daimler-Benz Aktiengesellschaft: *See—*
Enke, Kurt; Hespelt, Achim; Hertler, Eberhard; von der Ohe, Manfred; and Saftien, Udo, 4,561,640, Cl. 267-20.00A.
Gwinner, Dietrich; Merkle, Roland; and Noltemeyer, Friedrich, 4,561,388, Cl. 123-41.740.
Thiemann, Karl-Heinz; Weinert, Hans-Juergen; and Rauchle, Wilfried, 4,562,121, Cl. 428-607.000.
Zeilinger, Karl; and Bachschmid, Reiner, 4,561,634, Cl. 251-364.000.

Dainippon Screen Mfg. Co., Ltd.: *See—*
Taniguchi, Matsuyoshi, 4,561,535, Cl. 198-406.000.

Dairyman's Cooperative Creamery Assoc.: *See—*
Meade, Reginald E., 4,561,192, Cl. 34-10.000.

D'Aloisio, Rino: *See—*
Venturello, Carlo; D'Aloisio, Rino; and Ricci, Marco, 4,562,276, Cl. 556-20.000.

Dalso Maskinfabrik AF 1976 A/S: *See—*
Thomsen, Torben H., 4,561,420, Cl. 126-77.000.

D'Ambra, Roberto: *See—*
Gazzi, Luigi; D'Ambra, Roberto; Di Cintio, Roberto; Rescalli, Carlo; and Vetere, Alessandro, 4,561,869, Cl. 62-17.000.

Dana Corporation: *See—*
Jester, Terry L., 4,561,325, Cl. 74-745.000.
Yarnell, James A., 4,561,321, Cl. 74-473.00R.

Dancy, William B.; and Meng, Hsi, to International Minerals & Chemical Corp. Process for crystallizing potassium sulfate. 4,562,058, Cl. 423-551.000.

Danfoss A/S: *See—*
Blohm, Knud; and Petersen, Hans P. B., 4,561,345, Cl. 91-459.000.
Johansson, Gustav A., 4,561,264, Cl. 62-292.000.

Daniels, John Y., to Springs Industries, Inc. Textile fabrics with opaque pigment printing and method of producing same. 4,562,107, Cl. 428-196.000.

Dantzig, Jonathan A.; and Patton, John V., to Olin Corporation. Flux concentrator. 4,561,489, Cl. 164-467.000.

Dao, Loan H.: *See—*
Singhal, Gopal H.; Colle, Karla S.; Edelson, Edward H.; Wilson, Bobby L.; and Dao, Loan H., 4,561,964, Cl. 208-10.000.

Darden, Jerome W., to Texaco Inc. High lead solder corrosion inhibitors. 4,561,990, Cl. 252-75.000.

Darms, Roland; Beyeler, Harry; and Haug, Theobald, to Ciba-Geigy Corporation. Flexible, printed circuit. 4,562,119, Cl. 428-458.000.

Darner, James C.: *See—*
Stoermer, Ralph T., III; and Darner, James C., 4,562,051, Cl. 423-219.000.

David, Constant V. Dual flush toilet for water saving. 4,561,131, Cl. 4-326.000.

David, Constant V. Free piston external combustion engines. 4,561,252, Cl. 60-595.000.

David, Constant V. Bar riding wheel. 4,561,656, Cl. 273-110.000.

Davis, Clerie R., executor: *See—*
Davis, Robert K., deceased, 4,562,125, Cl. 429-65.000.

Davis, Dwight P.; and Doherty, Francis G., to Betz Laboratories, Inc. Method for controlling mollusks. 4,561,983, Cl. 210-755.000.

Davis, Harold E. Portable universal power miter saw workbench. 4,561,336, Cl. 83-859.000.

Davis, Mark S.: *See—*
Fender, Norman N.; and Davis, Mark S., 4,561,592, Cl. 239-587.000.

Davis, Marshall E.; and Sung, Rodney L., to Texaco Inc. Motor fuel composition. 4,561,861, Cl. 44-51.000.

Davis, Richard K.; and McKnight, William S., to General Electric Company. Stylus type touch probe system. 4,562,392, Cl. 318-572.000.

Davis, Robert K., deceased (by Davis, Clerie R., executor), to Roper Corporation. Battery hold-down strap and terminal protector. 4,562,125, Cl. 429-65.000.

Dayen, Leonid, to Horton Manufacturing Co., Inc. Device for enhancing cooling. 4,561,522, Cl. 188-71.600.

Dayton Reliable Tool & Mfg. Co.: *See—*
Bachmann, Henry C.; Brown, Omar L.; Fraze, Ermal C.; Gregg, James R.; and Wynn, David K., 4,561,280, Cl. 72-346.000.

Dean, Barry D., to Atlantic Richfield Company. Polyether sulfone resin containing molding composition and method. 4,562,231, Cl. 525-189.000.

Dean, Edward E.: *See—*
Tomlinson, Samuel J., Sr.; Dean, Edward E.; and Adams, Leon M., 4,562,212, Cl. 514-690.000.

Dean, Sheldon W.: *See—*
Grab, George D.; and Dean, Sheldon W., 4,562,052, Cl. 423-235.000.

Deere & Company: *See—*
Rutan, Fred E.; and Chmelar, Mark A., 4,561,559, Cl. 220-203.000.
Wolf, Lester C.; and Lundie, William R., 4,561,565, Cl. 222-28.000.

Defender Energy of Connecticut, Inc.: *See—*
Gold, Stanley; Newman, Robert; and Lavigne, Eric, 4,561,223, Cl. 52-202.000.

Degremont: *See—*
Bernard, Jacques; Rovel, Jean-Marie; Nicol, Roger; and Prevot, Claude, 4,561,974, Cl. 210-151.000.

Degussa Aktiengesellschaft: *See—*
Kleemann, Axel; Martens, Jurgen; and Weigel, Horst, 4,562,152, Cl. 435-116.000.
Kleemann, Axel; Martens, Jurgen; and Weigel, Horst, 4,562,153, Cl. 435-116.000.

Del West Engineering, Inc.: *See—*
Jette, Paul M., 4,561,392, Cl. 123-90.430.

DeLage, Frank. Water-resistant device for protecting an electronic sound producing apparatus and loudspeaker system. 4,562,590, Cl. 381-90.000.

Dell'Acqua, Ernani: *See—*
Bruzzese, Tiberio; Dell'Acqua, Ernani; and Van Den Heuvel, Holger H., 4,562,203, Cl. 514-468.000.

Delmas, Michel: *See—*
Le Bigot, Yves; Audoye, Paul; Delmas, Michel; and Gaset, Antoine, 4,562,273, Cl. 549-473.000.

Del Medico, Anthony P., to Siemens Eammasonics, Inc. Method and device for producing nuclear images. 4,562,353, Cl. 250-363.00S.

DeLorenzi, Benjamin; and Comerford, Robert B., to Foster & Allen, Inc. Method and apparatus for automatically coiling and taping elongated tubing and the like. 4,561,923, Cl. 156-350.000.

Del Vecchio, Alfonso; and Sestini, Grazia, to Scharper S.p.A. per l'Industria Farmaceutica. 2-(4-Biphenylyl)-4-hexenoic acid and derivatives thereof having anti-inflammatory activity. 4,562,287, Cl. 562-492.000.

Deman, Pierre; and Potage, Jean, to Thomson CSF. Speech processing device for radioelectric equipment adapted for speech transmission and reception. 4,562,571, Cl. 370-7.000.

De Marchi, Jean-Louis: *See—*
Petrini, Roland; and De Marchi, Jean-Louis, 4,561,196, Cl. 36-118.000.

Demoute, Jean-Pierre: *See—*
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,562,282, Cl. 560-184.000.

Denar Corporation: *See—*
Polizzotto, Joseph F., 4,561,846, Cl. 433-73.000.

Denton, Jerry N., to North American Philips Consumer Electronics Corp. Video disc turntable having clamping device. 4,562,570, Cl. 369-270.000.

De Rouen, Keith J. Decoratable wall switch actuator. 4,562,325, Cl. 200-331.000.

Desco K/S: *See—*
Andersson, Finn, 4,562,053, Cl. 423-235.000.

DeSoto, Inc.: *See—*
Leo, A. Frank, 4,561,950, Cl. 522-91.000.
Zimmerman, John M.; Krajewski, John J.; and Noren, Gerry K., 4,562,235, Cl. 526-304.000.

Devaney, Anthony J., to Schlumberger Technology Corporation. Diffraction tomography system and methods. 4,562,540, Cl. 364-400.000.

Deves, Patrick, to Cibie Projecteurs. Headlamp for an automobile. 4,562,519, Cl. 362-308.000.

de Villepoix, Raymond; Fages, Jean; Forges, Robert; Abbes, Claude; and Rouaud, Christian, to Commissariat a l'Energie Atomique. Flexible metal sealing joint incorporating expendable projecting portions. 4,561,662, Cl. 277-229.000.

Devimeux, Daniel P.: *See—*
Clapp, Craig S. K.; Shilston, Norman L.; Jolivet, Jean-Claude R.; Devimeux, Daniel P.; and Riou, Armand, 4,562,466, Cl. 358-133.000.

DeWitt, Nick; and Greene, Lindsey C., to X-Ten Corporation. Extensible chassis for hauling containers. 4,561,671, Cl. 280-404.000.

DeYoung, Simon A.; and Naft, Manny H., to Clark Equipment Company. Off-highway vehicle ride strut and method. 4,561,641, Cl. 267-64.130.

Diamond, Craig J.: *See—*
Tegeler, John J.; and Diamond, Craig J., 4,562,186, Cl. 514-238.000.
Tegeler, John J.; and Diamond, Craig J., 4,562,187, Cl. 514-238.000.

Diaz, Frank V. Washing machine rinse-water diverter valve. 4,561,471, Cl. 137-870.000.

Di Cintio, Roberto: *See—*
Gazzi, Luigi; D'Ambra, Roberto; Di Cintio, Roberto; Rescalli, Carlo; and Vetere, Alessandro, 4,561,869, Cl. 62-17.000.

Dickie, Ray A.: *See—*
Mangels, John A.; and Dickie, Ray A., 4,562,041, Cl. 419-40.000.

Dickson, James; and Hays, Charles, to Gray Tool Company. Method for improving the density, strength and bonding of coatings. 4,562,090, Cl. 427-34.000.

Dienes Werke fur Maschinenteille, GmbH & Co. KG: *See—*
Wingen, Peter P., 4,561,335, Cl. 83-481.000.

Diffracto Ltd.: *See—*
Pryor, Timothy R., 4,561,776, Cl. 356-72.000.

Digimetrics, Inc.: *See—*
Hamilton, Rodrick J., 4,562,330, Cl. 219-110.000.

Dillman, Bruce, to Bituma-Stor, Inc. Portable self-erecting surge storage silo. 4,561,821, Cl. 414-332.000.

Dingess, Billy E. Remote manipulator arm for nuclear generator repair. 4,561,816, Cl. 414-4.000.

Dinh, Chom T. L.; Garceau, Roger; Pastor, Marc; and Terreault, Gerard, to Centre de Recherche Industrielle du Quebec. Electrical noise reducer for T.V. signals. 4,562,470, Cl. 358-167.000.

Dinnage, Derek F.; and Worrall, George F., to APV Equipment, Incorporated. Essence recovery process. 4,561,941, Cl. 203-24.000.

Dionne, Norman J., to Raytheon Company. Tilt-angle electron gun. 4,562,380, Cl. 315-4.000.

Dixon, David S.: *See—*
Benz, Frank J.; Shaw, Randall C.; and Dixon, David S., 4,561,784, Cl. 374-8.000.

Dobashi, Yoshitomi; Asakura, Masahiko; and Kohmoto, Kohtaro, to Tokyo Shibaura Denki Kabushiki Kaisha. Glow switch starter having metal oxide deposit. 4,562,379, Cl. 313-619.000.

Dr. C. Otto & Comp. G.m.b.H.: *See—*
Struck, Carl-Heinz; Schumacher, Ralf; Kohler, Ingomar; and Leppert, Gerd-Ullrich, 4,561,843, Cl. 432-214.000.

Dr. Ing. h.c.F. Porsche Aktiengellschaft: *See—*
Hausinger, Otto, 4,561,322, Cl. 74-475.000.

Dr. Ing.h.c.F. Porsche Aktiengesellschaft: *See—*
Korkemeier, Hans; Martschik, Walter; and Klieber, Josef, 4,561,387, Cl. 123-41.310.

Doering, Robert R.; and Armstrong, Gregory J., to Texas Instruments Incorporated. Method of making field-plate isolated CMOS devices. 4,561,170, Cl. 29-571.000.

Doering, Robert R.: *See—*
Slawinski, Christopher; Doering, Robert R.; and Teng, Clarence W., 4,561,172, Cl. 29-576.00W.

Doherty, Francis G.: *See—*
Davis, Dwight P.; and Doherty, Francis G., 4,561,983, Cl. 210-755.000.

Doi, Ryouta: *See—*
Shimizu, Toshio; Satou, Takanori; Tsukui, Tsutomu; Doi, Ryouta; and Yamaguchi, Motoo, 4,562,123, Cl. 429-27.000.

Dola, Frank P., to AMP Incorporated. Telephone network interface device. 4,562,311, Cl. 179-158.00R.

Domic, Esteban M.; and Hein, Hans C., to Sociedad Minera Pudahuel Ltda., C.P.A. Process for recovering metals from solution through solvent extraction and pyrometallurgical reduction. 4,561,887, Cl. 75-65.00R.

Domingo Mangone: *See—*
Mangone, Pascuale, 4,562,127, Cl. 429-89.000.

Dominion Engineering Works Limited: *See—*
Shaver, Marvin B.; and Guerguerian, Rhual L., 4,561,599, Cl. 241-34.000.

Donovan, John S. Symmetrical discriminator and demodulator. 4,562,403, Cl. 329-103.000.

Dorina Nahmaschinen GmbH: *See—*
Meier, Gunter, 4,561,369, Cl. 112-266.100.

Dory, Thomas S., to Olin Corporation. Use of selected beta-nitroalkenes as cetane number boosters for diesel fuel. 4,561,862, Cl. 44-57.000.

Dos Santos, Joseph A., to Continental Conveyor & Equipment Co., Inc. Pressure device for conveyor. 4,561,537, Cl. 198-628.000.

Doteuchi, Masami: *See*—
Adachi, Ikuo; Yamamori, Teruo; Ueda, Motohiko; and Doteuchi, Masami, 4,562,256, Cl. 546-120.000.
Douche, Jean-Pierre: *See*—
Coulon, Jean-Claude; and Douche, Jean-Pierre, 4,562,095, Cl. 427-180.000.
Douglass, Miriam L.: *See*—
Steltenkamp, Robert J.; Douglass, Miriam L.; and Natarelli, Gerard E., 4,562,064, Cl. 424-49.000.
Dow Chemical Company, The: *See*—
Behr, Raymond D.; and Zieke, Larry M., 4,562,027, Cl. 264-146.000.
Gilpin, Jo Ann; and Lindy, Lowell B., 4,562,280, Cl. 560-103.000.
Lysenko, Zenon; and Pews, R. Garth, 4,562,009, Cl. 260-465.600.
Pimlott, John R., 4,561,959, Cl. 204-253.000.
Dow Corning Corporation: *See*—
Lo, Peter Y. K.; Thayer, LeRoy E.; and Wright, Antony P., 4,562,096, Cl. 427-208.800.
Dow Corning, Ltd.: *See*—
Hill, Michael P., 4,562,278, Cl. 556-418.000.
Doyle, Richard C.: *See*—
Isbister, Jenefir D.; and Doyle, Richard C., 4,562,156, Cl. 435-253.000.
Draber, Wilfried: *See*—
Thomas, Rudolf; Draber, Wilfried; Schmidt, Robert R.; and Eue, Ludwig, 4,561,879, Cl. 71-92.000.
Drake, Cyril F.; Jones, Gladys M.; and Jones, Ronald, to ITT Industries, Inc. Corrosion inhibiting coatings. 4,561,896, Cl. 106-14.120.
Drent, Eit, to Shell Oil Company. Process for the preparation of carboxylic acids. 4,562,284, Cl. 562-406.000.
Dreyer, Paul L.; and McLennan, William R., to Ecolaire Incorporated. Sliding blade closure apparatus with inflatable sealing ring. 4,561,472, Cl. 138-94.300.
Drummond, Andrew F., to Programasyst Limited. Control of real time industrial processes. 4,562,529, Cl. 364-140.000.
Dual-Lite Manufacturing: *See*—
MacDonald, Robert D., Jr.; Luca, William A.; and Johnstone, Robert M., 4,561,203, Cl. 40-570.000.
Dubreux, Eric: *See*—
Assedo, Raphael; and Dubreux, Eric, 4,562,038, Cl. 376-353.000.
Duce, Edward, to Stockrail Services Limited. Overhead conveyor systems. 4,561,359, Cl. 104-94.000.
Duffy, Dennis A. Brake wear sensor. 4,562,421, Cl. 340-52.00A.
Duffy, James J., to Ford Motor Company. Variable assist power steering system. 4,561,521, Cl. 180-142.000.
Dunlop Olympics Limited: *See*—
Wilkinson, Maxwell; Patten, Malcolm J.; and Lee, Jeffrey H., 4,561,267, Cl. 66-178.00A.
Dunn, Gerald R.: *See*—
Abel, Kenneth N.; and Dunn, Gerald R., 4,561,586, Cl. 228-264.000.
Duo-Matic/Olsen Inc.: *See*—
Hwang, Kyu S.; and Koestler, Dennis J., 4,561,421, Cl. 126-110.00R.
Du Pont de Nemours, E. I., and Company: *See*—
Fryd, Michael; and Merriman, Burt T., Jr., 4,562,100, Cl. 427-385.500.
Matrick, Howard, 4,561,899, Cl. 106-193.00P.
Durvasula, Visweswara R., to UpJohn Company, The. Preparation of 3-alkanoyloxyphthalides. 4,562,271, Cl. 549-310.000.
Duttweiler, Donald L., to AT&T Bell Laboratories. Subsampling delay estimator for an echo canceler. 4,562,312, Cl. 179-170.200.
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Huber, Hans; and Vollkommer, Norbert, 4,562,225, Cl. 524-602.000.
Schmidt, Hans-Georg, 4,562,270, Cl. 549-294.000.
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Pabst, Horst; and Brinkmann, Hans, 4,562,023, Cl. 264-75.000.
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Lilja, Per, 4,561,319, Cl. 74-61.000.
Dzewaltowski, Victor F.; and Farmer, Steven P., to Ex-Cell-O Corporation. Close tolerance internal grinding using coolant mist. 4,561,218, Cl. 51-290.000.
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Hoyt, Robert M.; Dziedzic, Edward; and Rinehart, William M., 4,561,231, Cl. 52-297.000.
Dziki, Michael M., to Minnesota Mining and Manufacturing Company. Thermoplastic dispensing device with outlet cooling chamber. 4,561,569, Cl. 222-146.500.
E. D. Bullard Company: *See*—
Brockway, Brock F.; Moretti, Anthony L.; Pellolio, Anselmo P.; and Rasmussen, Jimmie, 4,561,162, Cl. 29-428.000.
Eagle-Picher Industries, Inc.: *See*—
Markle, Richard A.; and Melchior, Wayne R., 4,562,008, Cl. 260-465.400.
Earley, Fergus G. P.: *See*—
Lowe, Christopher R.; and Earley, Fergus G. P., 4,562,157, Cl. 435-291.000.
Eastern Virginia Medical Authority: *See*—
Schellenberg, Karl A., 4,562,158, Cl. 436-57.000.
Eastman Kodak Company: *See*—
Ellis, Richard G.; and Alksninis, Audra T., 4,561,646, Cl. 271-236.000.
Reczek, James A., 4,562,139, Cl. 430-223.000.
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Ebauches Electroniques SA: *See*—
Jeannot, Michel; and Salvalai, Italo, 4,561,960, Cl. 204-297.00W.
Eberhardt, Mark E., Jr., to Hobart Corporation. Control system and method of controlling a dishwashing machine. 4,561,904, Cl. 134-18.000.
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Meyer, Willy; Topfl, Werner; Kristinsson, Haukur; and Eckhardt, Wolfgang, 4,562,210, Cl. 514-604.000.
Ecolaire Incorporated: *See*—
Dreyer, Paul L.; and McLennan, William R., 4,561,472, Cl. 138-94.300.
Ecton, William W., to NCR Corporation. System and method for stabilizing asynchronous state machines. 4,562,427, Cl. 340-825.500.
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Ederer, Ulf G.: *See*—
Ehrentraut, Otto; and Ederer, Ulf G., 4,561,787, Cl. 384-295.000.
Edwards, James W.: *See*—
Wrobleski, James T.; Edwards, James W.; Graham, Charles R.; Keppel, Robert A.; and Raffelson, Harold, 4,562,268, Cl. 549-259.000.
Edwards, William B., III; and Houminer, Yoram, to Philip Morris Incorporated. 1,4-Diacylpiperazine flavored smoking compositions. 4,561,451, Cl. 131-278.000.
Egan, Richard G., to Polaroid Corporation. Color laser printer with improved efficiency. 4,562,462, Cl. 358-75.000.
Egner, Rudolf: *See*—
Zulauf, Karlheinz; and Egner, Rudolf, 4,561,570, Cl. 222-153.000.
Ehrentraut, Otto; and Ederer, Ulf G., to Miba Gleitlager Aktiengesellschaft. Composite sliding surface bearing. 4,561,787, Cl. 384-295.000.
Ehring, Carolyn C.; and Baumgartner, Edward W., to Cairns & Brother Inc. Multilayered protective trouser. 4,561,121, Cl. 2-2.000.
Eichweber, Kurt, to Precitronic Gesellschaft fur Feinmechanik und Electronic mbH. Device for simulating combat firing between combat participants. 4,561,849, Cl. 434-22.000.
Eisai Co., Ltd.: *See*—
Tokumori, Yutaka; Mokuda, Osamu; Ikeda, Tadasu; Takeda, Akira; Tominaga, Masato; and Mashiba, Hiroto, 4,562,071, Cl. 424-94.000.
Eisemann, Kurt, to U.S. Philips Corporation. Disc player. 4,562,566, Cl. 369-75.200.
Ekenved, Gunnar H.: *See*—
Appelgren, Curt H.; Bogentoft, Conny B.; and Ekenved, Gunnar H., 4,562,061, Cl. 424-32.000.
Ektelon: *See*—
Mortvedt, Raymond L., 4,561,655, Cl. 273-73.00H.
Elbe, Hans-Ludwig; Jautelat, Manfred; Buchel, Karl H.; Brandes, Wilhelm; Hanssler, Gerd; and Reinecke, Paul, to Bayer Aktiengesellschaft. Combating fungi with substituted azolyl-tetrahydro-furan -2-ylidene-methane derivatives. 4,562,198, Cl. 514-383.000.
Elcrin, Alain; and Chambron, Edmond, to Thomson CSF. Telescopic cylindrical tube column. 4,561,798, Cl. 403-109.000.
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Lawrence, William, 4,562,337, Cl. 219-421.000.
Electric Power Research Institute: *See*—
Bedell, John R., 4,561,487, Cl. 164-253.000.
Electricite de France Service National: *See*—
Marino, Jean-Claude; Marquet, Andre ; and Wetzel, Philippe, 4,561,306, Cl. 73-432.00R.
Elliott, William J., to Quietlite International Ltd. Solid-state inverter including a multiple core transformer. 4,562,382, Cl. 315-219.000.
Ellis, Joseph J., Jr.; and Emerson, Geoffrey A., to International Business Machines Corporation. Data management for plasma display. 4,562,450, Cl. 340-771.000.
Ellis, Richard G.; and Alksninis, Audra T., to Eastman Kodak Company. Sheet registration mechanism. 4,561,646, Cl. 271-236.000.
Emerson Electric Co.: *See*—
Lautzenheiser, Terry L., 4,562,515, Cl. 362-33.000.
Emerson, Geoffrey A.: *See*—
Ellis, Joseph J., Jr.; and Emerson, Geoffrey A., 4,562,450, Cl. 340-771.000.
Emhart Industries, Inc.: *See*—
Foster, Thomas V., 4,561,875, Cl. 65-267.000.
Endo, Tadashi; Sato, Tadao; and Fukunaga, Osamu, to National Institute for Researches in Inorganic Materials. Boron nitride complex and process for its preparation, and process for preparing a light-transmitting dense body of cubic system boron nitride. 4,562,163, Cl. 501-96.000.
Energy Equipment Company, Ltd., The: *See*—
Cross, Henry F.; and Harman, Maurice, 4,561,385, Cl. 122-4.00D.
Enichimica Secondaria, S.p.A.: *See*—
Neri, Carlo; Giroldini, William; Traversoni, Mario; Guizzi, Guido; Perrotti, Emilio; and Rinaldi, Antonio, 4,562,266, Cl. 549-462.000.
Enke, Kurt; Hespelt, Achim; Hertler, Eberhard; von der Ohe, Manfred; and Saftien, Udo, to Daimler-Benz Aktiengesellschaft. Wheel suspension system. 4,561,640, Cl. 267-20.00A.
Enkner, Bernhard: *See*—
Mullner, Paul; Enkner, Bernhard; and Hubweber, Gerhard, 4,561,883, Cl. 75-10.00R.
Ensley, Kenneth L.: *See*—
Moles, Oliver W.; Ensley, Kenneth L.; and Perkins, Haywood A., 4,562,048, Cl. 423-81.000.
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Envirotech Corporation: *See*—
Janecek, Kenneth F., 4,561,978, Cl. 210-401.000.
Eouzan, Jean Y.; and Boyer, Robert, to Thomson-CSF. Digital circuit for the level alignment of an analog signal. 4,562,471, Cl. 358-172.000.
Erett, Richard E.: *See*—
Chou, Wayne W.; and Erett, Richard E., 4,562,306, Cl. 178-22.080.
Eriksson, Jan-Olof. Non-abrasive metal cleaning agent. 4,561,895, Cl. 106-3.000.
Erwin Sick GmbH Optik-Elektronik: *See*—
Smetana, Klaus, 4,561,722, Cl. 350-171.000.
ESCO Corporation: *See*—
Briscoe, Terry L.; and Van Hoomissen, Robert L., 4,561,154, Cl. 24-136.00K.
Espelage, Paul M.; and Lippitt, David L., to General Electric Company. Phase-locked loop control of an induction motor drive. 4,562,396, Cl. 318-809.000.
Essilor International "Cie Generale d'Optique" : *See*—
Bourset, Claude; and Wajs, Georges, 4,561,737, Cl. 351-160.00R.
Estwanik, Joseph J., III. Suspendible storage assembly. 4,561,547, Cl. 211-14.000.
Ethyl Corporation: *See*—
Hargis, Duane C., 4,562,296, Cl. 568-388.000.
Roper, Jerry M., 4,562,293, Cl. 568-347.000.
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Eue, Ludwig: *See*—
Thomas, Rudolf; Draber, Wilfried; Schmidt, Robert R.; and Eue, Ludwig, 4,561,879, Cl. 71-92.000.
Eurogrill B.V.: *See*—
Halters, M. A. M.; and Verwijmeren, A. S., 4,561,348, Cl. 99-421.00H.
Euroresearch S.R.L.: *See*—
Furlan, Diego, 4,562,191, Cl. 514-255.000.
Evans, Vaughn R.; Harris, Richard H.; Thorpe, Allan C.; and Watts, John E., to International Business Machines Corporation. Wire matrix print head apparatus. 4,561,790, Cl. 400-124.000.
Evers, Hans C. A.: *See*—
Broberg, Berndt F. J.; and Evers, Hans C. A., 4,562,060, Cl. 424-28.000.
Ex-Cell-O Corporation: *See*—
Dzewaltowski, Victor F.; and Farmer, Steven P., 4,561,218, Cl. 51-290.000.
Gaudreau, Laurent R., 4,562,032, Cl. 264-267.000.
Gray, John D., 4,562,025, Cl. 264-126.000.
Exxon Production Research Co.: *See*—
Choate, Thomas G. A., 4,561,679, Cl. 285-95.000.
Exxon Research & Engineering Co.: *See*—
Graves, Victoria, 4,562,170, Cl. 502-113.000.
Singhal, Gopal H.; Colle, Karla S.; Edelson, Edward H.; Wilson, Bobby L.; and Dao, Loan H., 4,561,964, Cl. 208-10.000.
Small, Augustus B.; Hughes, Vincent L.; and Benitez, Francisco M., 4,562,233, Cl. 526-76.000.
Ezaki, Joichiro; Kanai, Hiroshi; and Kitahara, Yoshimi, to TDK Corporation. Optical reproducing system. 4,562,502, Cl. 360-114.000.
F.F. Seeley Nominees Pty. Ltd.: *See*—
Colliver, Anthony D., 4,562,016, Cl. 261-106.000.
F. J. Littell Machine Co.: *See*—
Wiig, Chester M., 4,561,582, Cl. 226-142.000.
F. L. Smidth & Co. A/S: *See*—
Bhatia, Vinay K., 4,562,054, Cl. 423-244.000.
Nielsen, Peter B., 4,561,842, Cl. 432-106.000.
Fabbri, Vittorio E.; and Bell, Jackie D. Color coordinator device. 4,561,850, Cl. 434-98.000.
Faber, William M., Sr.: *See*—
Holmes, Curtis L.; Faber, William M., Sr.; Francis, Gaylord L.; and Boykin, Otis F., 4,561,996, Cl. 252-514.000.
Fages, Jean: *See*—
de Villepoix, Raymond; Fages, Jean; Forges, Robert; Abbes, Claude; and Rouaud, Christian, 4,561,662, Cl. 277-229.000.
Falk, David O.: *See*—
Norton, Charles J.; Falk, David O.; and Hill, Alfred D., 4,561,502, Cl. 166-274.000.
Family Health International: *See*—
Wheeler, Robert G.; and Potts, David M., 4,561,433, Cl. 128-130.000.
Fang, Lawrence: *See*—
Labovitz, Jeffrey N.; and Fang, Lawrence, 4,561,881, Cl. 71-92.000.
Fanuc Limited: *See*—
Inaba, Hajimu; Sakakibara, Shinsuke; and Nihei, Ryo, 4,562,551, Cl. 364-513.000.
Fanuc Ltd: *See*—
Hattori, Masayuki; Nakamura, Shigeo; and Yairo, Osamu, 4,562,361, Cl. 307-270.000.
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Dzewaltowski, Victor F.; and Farmer, Steven P., 4,561,218, Cl. 51-290.000.
Farmer, William R. Picture scene apparatus. 4,561,202, Cl. 40-495.000.
Fassbinder, Hans-Georg, to Kloeckner Stahlforschung GmbH. Valve for supplying flow media. 4,561,466, Cl. 137-614.210.
Faulconer, Mark; and Langton, Allan R., to U.S.D. Corp. Buoyancy compensator, bladder, and process of manufacture. 4,561,853, Cl. 441-106.000.
Fauss, Rudolf: *See*—
Jager, Gerhard; Fauss, Rudolf; Findeisen, Kurt; Becker, Benedikt; and Homeyer, Bernhard, 4,562,185, Cl. 514-229.000.
Fehr, Hans; Pesch, Wolfgang; and Friedemann, Wolfgang, to Henkel Kommanditgesellschaft auf Aktien. Hardener for silicate soil stabilizers. 4,561,898, Cl. 106-74.000.
Fencl, Vernon R.: *See*—
Tan, Archie; and Fencl, Vernon R., 4,562,326, Cl. 219-59.100.
Fender, Norman N.; and Davis, Mark S., to Graco Robotics, Inc. Robot spray head. 4,561,592, Cl. 239-587.000.
Fenn & Company: *See*—
Fenn, George S., 4,561,995, Cl. 252-194.000.
Fenn, George S., to Fenn & Company. Material for drying cut plants and methods of facilitating such drying. 4,561,995, Cl. 252-194.000.
Fera, Claudio: *See*—
Kvas, Peter J.; and Fera, Claudio, 4,561,210, Cl. 49-372.000.
Fernandez, John J. Self-cleaning smog control filter for internal combustion engines. 4,561,409, Cl. 123-572.000.
Ferraro, Thomas A., to Lock Jaws, Inc. Jaw locking means for lathe chucks. 4,561,663, Cl. 279-123.000.
Ferreira, Lloyd A.; and Mannheimer, Jeffrey S., to Biostim, Inc. Apparatus for demonstrating and/or teaching alleviation of pain with transcutaneous electrical nerve stimulators. 4,561,851, Cl. 434-272.000.
Ferro, Gregory A.: *See*—
Lee, Raymond; Ferro, Gregory A.; and Okey, David W., 4,562,112, Cl. 428-318.600.
Ferry, Michel F. M. S.; and Trehin, Jacques L., to International Business Machines Corporation. DC Power supply circuit for line interface circuits. 4,562,525, Cl. 363-45.000.
Fiat Allis Europe S.p.A.: *See*—
Barbagli, Rino O.; and Marras, Gaetano, 4,561,513, Cl. 180-6.480.
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Wossner, Felix; Itzinger, Hermann; and Schopplein, Leopold, 4,561,164, Cl. 29-510.000.
Fields, Leland S. Router jointing fixture. 4,561,478, Cl. 144-144.00R.
Filreis, Manuel: *See*—
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Findeisen, Kurt: *See*—
Jager, Gerhard; Fauss, Rudolf; Findeisen, Kurt; Becker, Benedikt; and Homeyer, Bernhard, 4,562,185, Cl. 514-229.000.
Findlay, John W. A.; and Coker, Geoffrey G. 6-[3-Amino-1-(4-tolyl)-prop-1E-enyl]pyridine-2-carboxylic acid derivatives having antihistaminic activity. 4,562,258, Cl. 546-281.000.
Findley Adhesives, Inc.: *See*—
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Findley, Kenneth N., Jr.: *See*—
Scharfenberg, Paul M.; and Findley, Kenneth N., Jr., 4,561,918, Cl. 156-78.000.
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Wiech, Raymond E., Jr., 4,562,092, Cl. 427-58.000.
Finkelmeier, Horst: *See*—
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Firestone Tire & Rubber Company, The: *See*—
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Kang, Jung W., 4,562,171, Cl. 502-117.000.
Kang, Jung W.; and Hall, James E., 4,562,172, Cl. 502-117.000.
Fischer, Edgar; and Schlingmann, Merten, to Hoechst Aktiengesellschaft. Process for isolating microbial polysaccharides from their amine adducts. 4,562,252, Cl. 536-114.000.
Fischer & Porter Company: *See*—
Shauger, Herbert A., 4,562,547, Cl. 364-484.000.
Fischer, Ronald E. Protective pad for side of motor vehicle. 4,561,685, Cl. 293-128.000.
Fisher, Michael M.: *See*—
Wang, David W.; Fisher, Michael M.; and Thomas, Walter M., 4,562,246, Cl. 528-423.000.
Fisher, Robert L., to Kollmorgen Technologies Corporation. Brushless DC tachometer. 4,562,399, Cl. 322-94.000.
Fitzgerald-Smith, James P., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Transportable pontoon. 4,561,376, Cl. 114-267.000.
Fitzke, Emil V.: *See*—
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Flam, Eric: *See*—
Allen, Douglas, Jr.; and Flam, Eric, 4,561,858, Cl. 604-336.000.
Fleischer, Dietrich: *See*—
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Fleischer, Jean C.: *See*—
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Fleming, William F., III; and Jones, Roger D., to RJR Archer, Inc. Precision slitting of material. 4,561,579, Cl. 225-2.000.
Fletcher, Aaron N.; and Knipe, Richard H., to United States of America, Navy. Photolytic improvement of dye laser lifetimes. 4,562,580, Cl. 372-69.000.
Fletcher, Ian J.: *See*—
Balli, Heinz; Gunzenhauser, Sigmund; Fletcher, Ian J.; and Bedekovic, Davor, 4,562,449, Cl. 346-218.000.
Flo-Con Systems, Inc.: *See*—
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Kankare, Jouko, 4,561,962, Cl. 204-415.000.
FMC Corporation: *See—*
Kreamer, William C., 4,561,236, Cl. 53-509.000.
Orlando, Franklin P.; Goulart, Joseph S.; and Chandra, Rangasami S., 4,561,299, Cl. 73-151.000.
Fogelberg, Mark J., to Borg-Warner Corporation. Magnetically synchronized clutch apparatus. 4,561,520, Cl. 180-247.000.
Foller, Werner, to GESTRA Kondensatableiter GmbH & Co. Bimetallically controlled steam trap. 4,561,588, Cl. 236-59.000.
Fons, Gerrit, to Jansens & Dieperink B.V. Large container especially a silo. 4,561,222, Cl. 52-197.000.
Fontaine, Paul I.; Jones, Evan T. R.; and Batham, John K., to Foseco International Limited. Calcium oxide based flux compositions. 4,561,894, Cl. 75-257.000.
Ford Aerospace & Communications Corporation: *See—*
Peralta, Eduardo J.; and Reitz, Kay M., 4,562,439, Cl. 343-17.10R.
Ford Motor Company: *See—*
Duffy, James J., 4,561,521, Cl. 180-142.000.
Fulghum, Donald R.; and Muir, Ronald C., 4,561,643, Cl. 269-43.000.
Mangels, John A.; and Dickie, Ray A., 4,562,041, Cl. 419-40.000.
McCarthy, Shaun L., 4,561,303, Cl. 73-204.000.
Simko, Aladar O., 4,561,391, Cl. 123-90.270.
Forges, Robert: *See—*
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Fornadel, J. Stephen; and Long, Harry F., to Armstrong World Industries, Inc. Formable pulp compositions. 4,562,218, Cl. 524-15.000.
Forney, George D., Jr., to Codex Corporation. Symbol coding apparatus. 4,562,426, Cl. 340-347.0DD.
Forry, John S.; and Garrick, John R., to Armstrong World Industries, Inc. Material repulsion by electrostatic charge. 4,562,510, Cl. 361-212.000.
Forsyth, Ronald J., to GenCorp Inc. Insulated bead for a radial steel ply tire. 4,561,919, Cl. 156-136.000.
Forsythe, Marjorie A. Adjustable rest for the feet of the human body with optional exercise feature. 4,561,649, Cl. 272-96.000.
Fory, Werner: *See—*
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Foseco International Limited: *See—*
Courtenay, John H.; and Phillips, Royston J., 4,561,912, Cl. 148-23.000.
Fontaine, Paul I.; Jones, Evan T. R.; and Batham, John K., 4,561,894, Cl. 75-257.000.
Foster & Allen, Inc.: *See—*
DeLorenzi, Benjamin; and Comerford, Robert B., 4,561,923, Cl. 156-350.000.
Foster, Arthur M., to Occidental Chemical Corporation. Process for preparing methoxytrifluoromethylnaphthoic acid from dimethylnaphthalene. 4,562,286, Cl. 562-467.000.
Foster, Ronald H., to Norchem, Inc. formerly Northern Petrochemical Company. Biaxially oriented oxygen and moisture barrier film. 4,561,920, Cl. 156-244.110.
Foster, Thomas V., to Emhart Industries, Inc. Mould arrangement for a cyclicly operating glassware forming machine. 4,561,875, Cl. 65-267.000.
Fox, Daniel J.: *See—*
Neiditch, Oscar W.; Hurdle, Edmund S.; and Fox, Daniel J., 4,562,002, Cl. 252-8.750.
Rubin, Fred K.; Blarcom, David V.; and Fox, Daniel J., 4,561,994, Cl. 252-187.230.
Fox, Wayne D., to Xerox Corporation. Charge erase device for copying or reproduction machines and printers. 4,561,761, Cl. 355-3.00R.
Fox, Wayne D., to Xerox Corporation. Blade cleaner apparatus for removing toner from a charge-retentive surface. 4,561,766, Cl. 355-15.000.
Framatome: *See—*
Plaige, Yves, 4,562,035, Cl. 376-215.000.
Framatome & Cie: *See—*
Assedo, Raphael; and Dubreux, Eric, 4,562,038, Cl. 376-353.000.
Francis, Gaylord L.: *See—*
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Franke, Werner, to Hoechst Aktiengesellschaft. Electrophotographic material with cyanine sensitizer with betaine group. 4,562,134, Cl. 430-83.000.
Frankfort, Eric J.; Kenney, George C., II; and McFarlane, Robert, to North American Philips Corporation. Apparatus for controlling the write beam in an optical data recording system. 4,562,567, Cl. 369-106.000.
Franklin, Robert P., to Trans-World Manufacturing Corporation. Variable multi-bay display. 4,561,550, Cl. 211-184.000.
Frantz, Virgil L., to Roanoke College. Relay valve. 4,561,464, Cl. 137-596.180.
Franz, Hans-Joachim; Sadler, Karl-Otto; and Schmidt, Willi, to Blohm & Voss AG. Ship with a piping system arranged on an inner deck. 4,561,372, Cl. 114-74.00R.
Franz, Michel R.: *See—*
Cavalier, Robert G.; Cordi, Alexis A.; Gillet, Claude L.; Janssens de Varebeke, Philippe M.; Niebes, Paul J.; Roba, Joseph L.; Van Dorsser, William R.; Lambelin, Georges E.; and Franz, Michel R., 4,562,205, Cl. 514-546.000.
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Fredriksen, Peter A.: *See—*
Bauer, Martin W.; Thys, Carl J.; Fredriksen, Peter A.; Robin, David J.; and Schaar, Richard J., 4,562,595, Cl. 455-345.000.
Fredrixon, Benny, to Ilsbo Industrier AB. Top structure. 4,561,262, Cl. 62-62.000.
Freed, Meier E.; and Abou-Gharbia, Magid A., to American Home Products Corporation. Substituted bi-alicyclic imides. 4,562,255, Cl. 544-357.000.
Freeman, Frederick O., to Champion Spark Plug Company. Mounting platform. 4,561,624, Cl. 248-639.000.
Freeny, Charles C., Jr.; and Rabin, Ronald J., to Power Technology Partners, Ltd. Electronic ammunition for simulating live ammunition detonation. 4,561,848, Cl. 434-18.000.
Freyssinet International (STUP): *See—*
Tourneur, Christian, 4,561,226, Cl. 52-223.00L.
Friedemann, Wolfgang: *See—*
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Friedrichs, Renate: *See—*
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Frisch, Kurt C.: *See—*
Peerman, Dwight E.; and Frisch, Kurt C., 4,561,922, Cl. 156-331.400.
Frischmann, Peter G.: *See—*
Taub, Alan I.; Frischmann, Peter G.; and Cline, Harvey E., 4,562,333, Cl. 219-121.0LJ.
Frito-Lay, Inc.: *See—*
McKee, Harris B., 4,562,084, Cl. 426-502.000.
Fritz Schafer Gesellschaft mit beschrankter Haftung: *See—*
Schafer, Gerhard, 4,561,705, Cl. 312-244.000.
Frost, Donald J., to Modine Manufacturing Company. Heat exchanger with back to back turbulators and flow directing embossments. 4,561,494, Cl. 165-76.000.
Fryd, Michael; and Merriman, Burt T., Jr., to Du Pont de Nemours, E. I., and Company. Polyimide coating compositions from diesterified anhydride and aromatic diamine. 4,562,100, Cl. 427-385.500.
Frye, Robert B., to General Electric Company. Dual component coating system. 4,562,219, Cl. 524-91.000.
Fryer, George B.: *See—*
Bednar, Gregory M.; and Fryer, George B., 4,562,594, Cl. 382-9.000.
Fuchs, Werner: *See—*
Rieber, Norbert; Bohm, Heinrich; Platz, Rolf; and Fuchs, Werner, 4,562,262, Cl. 548-257.000.
Fuji Jukogyo Kabushiki Kaisha: *See—*
Sakakiyama, Ryuzo, 4,562,541, Cl. 364-424.100.
Fuji Photo Film Co., Ltd.: *See—*
Harada, Shigeo, 4,562,579, Cl. 372-26.000.
Okano, Takeshi; and Ohtsuka, Shuichi, 4,561,769, Cl. 355-45.000.
Sasaki, Hirokazu; Morita, Akira; and Yamamoto, Takemasa, 4,561,944, Cl. 204-33.000.
Fuji Seiki Machine Works Ltd.: *See—*
Harada, Shooichi; and Ohtake, Matsuo, 4,561,219, Cl. 51-319.000.
Fuji Xerox Co., Ltd.: *See—*
Katsuno, Ryuji; and Tsuda, Toshihiko, 4,562,335, Cl. 219-216.000.
Takahashi, Toshikatsu; and Murata, Nobuo, 4,561,774, Cl. 355-75.000.
Fujieda, Mamoru: *See—*
Oyama, Yoshishige; Fujieda, Mamoru; and Yamauchi, Teruo, 4,561,403, Cl. 123-489.000.
Fujii, Etsuo; Satoh, Makoto; and Toyoda, Mitsuo, to Honda Giken Kogyo Kabushiki Kaisha. Tandem solenoid valve assembly including plural valve sections. 4,561,701, Cl. 303-119.000.
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Nagai, Kenji; and Fujii, Fumiaki, 4,562,408, Cl. 330-253.000.
Fujii, Masahiro: *See—*
Tanikawa, Keiichi; Fujii, Masahiro; and Kanno, Hideo, 4,561,911, Cl. 148-18.000.
Fujimoto, Tsunetomo, to Mitsubishi Denki Kabushiki Kaisha. Mobile substation. 4,562,360, Cl. 307-149.000.
Fujioka, Yoshiharu; Onuki, Akio; and Takei, Shushi, to Tokyo Shibaura Denki Kabushiki Kaisha. Perpendicular magnetic recording head. 4,562,503, Cl. 360-123.000.
Fujisawa Pharmaceutical Co., Ltd.: *See—*
Teraji, Tsutomu; Todo, Eishiro; Shimazaki, Norihiko; Oku, Teruo; and Namiki, Takayuki, 4,562,179, Cl. 514-77.000.
Ueda, Ikuo; Taniguchi, Kiyoshi; and Katsura, Yousuke, 4,562,190, Cl. 514-254.000.
Fujitani, Takashi, to Kabushiki Kaisha Gakushu Kenkyusha. School utensil and toy robot. 4,561,184, Cl. 33-27.020.
Fujitsu Limited: *See—*
Mizoshita, Yoshifumi, 4,562,499, Cl. 360-98.000.
Murano, Kazuo; Soejima, Tetsuo; and Amemiya, Shigeo, 4,562,573, Cl. 370-85.000.
Nishizawa, Hiroshi; Ando, Saburo; and Ito, Syuji, 4,562,532, Cl. 364-200.000.
Saito, Toshiyuki; Okubo, Naofumi; and Kaneko, Yoshiaki, 4,562,409, Cl. 330-286.000.
Sasaki, Shunroku; Tsukada, Kazuo; Kanzaki, Yoshiharu; and Hori, Yoshikazu, 4,562,437, Cl. 343-394.000.

Tanikawa, Kunihiro; and Ohtsuki, Osamu, 4,562,452, Cl. 357-24.000.
Tanizawa, Tetsu, 4,562,364, Cl. 307-454.000.
Fukui, Noboru: *See*—
Tamba, Shinichi; and Fukui, Noboru, 4,561,386, Cl. 123-41.700.
Fukui, Osamu; Inuizawa, Yoshihiro; Hinenoya, Saburo; and Takasaki, Yasufumi, to UBE Industries, Ltd. Modified polyolefin composition and process for producing the same. 4,562,230, Cl. 525-74.000.
Fukukura, Kazutoyo, to AMP Incorporated. Membrane type circuit having improved tail. 4,561,709, Cl. 339-17.00F.
Fukunaga, Osamu: *See*—
Endo, Tadashi; Sato, Tadao; and Fukunaga, Osamu, 4,562,163, Cl. 501-96.000.
Fulghum, Donald R.; and Muir, Ronald C., to Ford Motor Company. Rack assembly. 4,561,643, Cl. 269-43.000.
Fulton, Scott; Yankopoulos, Basil; and Zediana, Lewis, Jr., to Amicon Corporation. Agarose derivatives of amino phenyl boronic acid. 4,562,251, Cl. 536-17.400.
Funabashi, Motohisa: *See*—
Miyaoka, Shinichiro; Sekozawa, Teruji; Funabashi, Motohisa; and Hayashi, Shinobu, 4,562,552, Cl. 364-510.000.
Furlan, Diego, to Euroresearch S.R.L. Methyl-piperazino derivatives with analgesic activity. 4,562,191, Cl. 514-255.000.
Fursich, Manfred; and Treiber, Helmut, to Agfa Gevaert Aktiengesellschaft. Color copying method. 4,561,768, Cl. 355-38.000.
Furter, Gerhard; and Lahres, Hans, to Carl-Zeiss-Stiftung. Eyeglass lenses for persons suffering from severe ametropia. 4,561,736, Cl. 351-159.000.
Furukawa, Teruo: *See*—
Kawabata, Masaru; Furukawa, Teruo; and Ishibashi, Michiyasu, 4,562,491, Cl. 360-51.000.
Fuse, Mamoru, to Nippon Electric Co., Ltd. Semiconductor device having a resistor region with an enhanced breakdown voltage. 4,562,451, Cl. 357-13.000.
Fuse, Masaki: *See*—
Ooe, Akihiko; and Fuse, Masaki, 4,562,593, Cl. 382-6.000.
Futakuchi, Tomoaki, to Murata Manufacturing Co., Ltd. FM Demodulator with selective phase shift circuits. 4,562,404, Cl. 329-118.000.
Futatsuya, Fumio: *See*—
Shimano, Shizuo; Kobayashi, Shinichi; Yanagi, Mikio; Yamada, Osamu; Shida, Atsuhiko; and Futatsuya, Fumio, 4,561,880, Cl. 71-92.000.
G. A. Braun Inc.: *See*—
Southwick, Theron E.; and Mitchell, John W., 4,561,268, Cl. 68-210.000.
G. D. Searle & Co.: *See*—
Wagner, Hans, 4,562,192, Cl. 514-258.000.
Gaddy, William L. Off-set bottom bakery pan renovation process. 4,561,283, Cl. 72-414.000.
Gademann, Lothar: *See*—
Buchschmid, Emil; Gademann, Lothar; Hirt, Adam; Huttinger, Manfred; Jahn, Hans P.; Orova, Josef; Schmid, Hans-Dieter; and Steffen, Horst-Gunter, 4,561,410, Cl. 123-599.000.
Gaffney, John E., Jr., to International Business Machines Corporation. Software cryptographic apparatus and method. 4,562,305, Cl. 178-22.080.
Gahrs, Hans J., to Messer Griesheim GmbH. Procedure for producing low nicotine tobacco by means of high pressure extraction. 4,561,452, Cl. 131-297.000.
Galvin, Jay: *See*—
Mathews, Lester R.; and Galvin, Jay, 4,561,134, Cl. 4-496.000.
Gambaro, Mario: *See*—
Venturello, Carlo; and Gambaro, Mario, 4,562,299, Cl. 568-811.000.
Gang-Nail Systems, Inc.: *See*—
Rionda, Carlos S.; and Palacio, Joaquin J., 4,561,230, Cl. 52-289.000.
Garceau, Roger: *See*—
Dinh, Chom T. L.; Garceau, Roger; Pastor, Marc; and Terreault, Gerard, 4,562,470, Cl. 358-167.000.
Garner, Robert H.: *See*—
Cook, Jerry A.; Garner, Robert H.; Turner, Ralph E., Jr.; and Bilimoria, Bomi M., 4,561,597, Cl. 241-17.000.
Garrett Corporation, The: *See*—
Bunkoczy, Bela, 4,561,476, Cl. 141-311.00R.
Garrett, James R.: *See*—
Williams, Robert L.; and Garrett, James R., 4,561,188, Cl. 33-366.000.
Garrett, William R., to Hughes Tool Company. Roller-reamer. 4,561,508, Cl. 175-34.000.
Garrick, John R.: *See*—
Forry, John S.; and Garrick, John R., 4,562,510, Cl. 361-212.000.
Gartner, Karl, to Yoshida Kogyo K.K. Curtain wall units in a unit type curtain wall. 4,561,225, Cl. 52-220.000.
Gartung, Clifford W., to Pleion Corporation. Modular screen assembly. 4,561,229, Cl. 52-239.000.
Gaset, Antoine: *See*—
Le Bigot, Yves; Audoye, Paul; Delmas, Michel; and Gaset, Antoine, 4,562,273, Cl. 549-473.000.
Gaskell, Philip S.; Lagadec, Roger; and McNally, Guy, to Willi Studer AG. Apparatus for recording of digital data. 4,562,489, Cl. 360-39.000.
Gau, Wolfgang: *See*—
Rauleder, Gebhard; Waldmann, Helmut; Bottenbruch, Ludwig; Traenckner, Hans-Joachim; and Gau, Wolfgang, 4,562,274, Cl. 549-525.000.
Gaudino, Piero, to Officine Gaudino di P. Gaudino & C.S. a.s. Spinning or twisting machine having devices for the simultaneous automatic removal of all cops. 4,561,243, Cl. 57-274.000.
Gaudreau, Laurent R., to Ex-Cell-O Corporation. Method for forming grain coverings on reaction injection molded articles. 4,562,032, Cl. 264-267.000.
Gazzi, Luigi; D'Ambra, Roberto; Di Cintio, Roberto; Rescalli, Carlo; and Vetere, Alessandro, to Snamprogetti, S.p.A. Cryogenic process for the selective removal of acid gases from gas mixtures by means of a solvent. 4,561,869, Cl. 62-17.000.
Geiler, Volkmar: *See*—
Mennemann, Karl; Gliemeroth, Georg; Ross, Ludwig; Speit, Burkhard; Geiler, Volkmar; Krolla, Hans-Georg; and Meckel, Lothar, 4,562,161, Cl. 501-59.000.
Geis, Michael W.; and Smith, Henry I., to Massachusetts Institute of Technology. Product made by method of entraining dislocations and other crystalline defects. 4,562,106, Cl. 428-195.000.
GenCorp Inc.: *See*—
Forsyth, Ronald J., 4,561,919, Cl. 156-136.000.
General Aluminum Products, Inc.: *See*—
Austin, Barry G., 4,561,227, Cl. 52-226.000.
General Dynamics Pomona Division: *See*—
Maudal, Inge; Niemeier, Byron M.; and Wedertz, Larry D., 4,561,357, Cl. 102-439.000.
Shores, Marvin W., 4,561,183, Cl. 33-1.00M.
General Electric Company: *See*—
Alley, Robert P.; Harnden, John D., Jr.; and Kornrumpf, William P., 4,561,314, Cl. 73-862.690.
Axelrod, Robert J., 4,562,011, Cl. 260-978.000.
Beatty, Robert M.; Huber, Paul G.; and Miller, Edward B., 4,562,550, Cl. 364-492.000.
Davis, Richard K.; and McKnight, William S., 4,562,392, Cl. 318-572.000.
Espelage, Paul M.; and Lippitt, David L., 4,562,396, Cl. 318-809.000.
Frye, Robert B., 4,562,219, Cl. 524-91.000.
Hammer, Edward E.; and Lemmers, Eugene, 4,562,381, Cl. 315-99.000.
Kornrumpf, William P.; and Laughton, William J., 4,561,261, Cl. 62-126.000.
Liu, Ping Y., 4,562,222, Cl. 524-505.000.
Mark, Victor; and Hedges, Charles V., 4,562,242, Cl. 528-193.000.
Ohno, John M., 4,561,810, Cl. 407-118.000.
Owen, Daniel V., 4,562,384, Cl. 315-276.000.
Smith, Gary F., 4,562,232, Cl. 525-444.500.
Taub, Alan I.; Frischmann, Peter G.; and Cline, Harvey E., 4,562,333, Cl. 219-121.0LJ.
General Foods Corporation: *See*—
Gottesman, Martin, 4,562,083, Cl. 426-424.000.
Morimoto, Keisuke, 4,562,082, Cl. 426-104.000.
General Instrument Corporation: *See*—
Glaab, Joseph B., 4,562,465, Cl. 358-120.000.
General Kinematics Corporation: *See*—
Musschoot, Albert, 4,561,598, Cl. 241-19.000.
General Motors Corporation: *See*—
Lehnhoff, Richard N., 4,562,387, Cl. 318-285.000.
Raley, Ronald J.; and Warren, James R., 4,561,211, Cl. 49-374.000.
Smith, Lyle B., 4,561,460, Cl. 137-493.200.
Sprenger, Willi, 4,561,689, Cl. 296-84.00A.
Genne, Lee A.: *See*—
Chartrain, Armand N.; and Genne, Lee A., 4,562,126, Cl. 429-72.000.
Genth, Hermann: *See*—
Kuhle, Engelbert; Paulus, Wilfried; Genth, Hermann; Brandes, Wilhelm; and Reinecke, Paul, 4,562,208, Cl. 514-593.000.
Gerard, Jean-Louis: *See*—
Bricot, Claude; Berthet, Pierre; and Gerard, Jean-Louis, 4,562,564, Cl. 369-44.000.
Gerber, David W., to Babcock & Wilcox Company, The. Swivel joint assembly. 4,561,680, Cl. 285-98.000.
Gerber, Heinz J., to Gerber Scientific Inc. Making of garment by single ply cutting followed by successive sewing stages. 4,561,127, Cl. 2-243.00R.
Gerber Products Company: *See*—
Spletzer, Barry L.; and Swiatlowski, George, 4,561,817, Cl. 414-119.000.
Gerber, Richard; and Trautwein, Dieter, to Robert Bosch GmbH. Automotive-type distributor rotor with built-in suppressor resistor. 4,562,317, Cl. 200-19.0DR.
Gerber Scientific Inc.: *See*—
Gerber, Heinz J., 4,561,127, Cl. 2-243.00R.
Gerkema, Jan; Niessen, Anton K.; and Pelzer, Jozef B., to U.S. Philips Corporation. X-Ray tube having a rotary anode. 4,562,587, Cl. 378-133.000.
Gerlach, Heinz; and Worner, Lothar, to Kautt & Bux KG. Commutator and method of manufacture thereof. 4,562,369, Cl. 310-235.000.
Gesellschaft fur Schwerionenforschung mbH Darmstadt: *See*—
Keller, Roderich; and Nohmayer, Fritz, 4,562,355, Cl. 250-423.00R.
Geskin, Ernest S. Method of heating, melting and coal conversion and apparatus for the same. 4,561,886, Cl. 75-51.200.
GESTRA Kondensatableiter GmbH & Co.: *See*—
Foller, Werner, 4,561,588, Cl. 236-59.000.
Getrag Getriebe- und Zahnradfabrik GmbH: *See*—
Knodel, Gunter, 4,561,532, Cl. 192-106.100.
Gewerkschaft Eisenhutte Westfalia: *See*—
Hauschopp, Alois, 4,561,697, Cl. 299-43.000.

Gibli, Elizor. Brush assembly tool. 4,561,174, Cl. 29-597.000.

Gill, Michael T.; and Rogers, Mark C., to Advanced Solar Systems. Nontracking parabolic solar energy collector apparatus. 4,561,424, Cl. 126-438.000.

Gillet, Claude L.: *See*—
Cavalier, Robert G.; Cordi, Alexis A.; Gillet, Claude L.; Janssens de Varebeke, Philippe M.; Niebes, Paul J.; Roba, Joseph L.; Van Dorsser, William R.; Lambelin, Georges E.; and Franz, Michel R., 4,562,205, Cl. 514-546.000.

Gilpin, Jo Ann; and Lindy, Lowell B., to Dow Chemical Company, The. Chloromethylation of deactivated aromatic compounds. 4,562,280, Cl. 560-103.000.

Gindre, Andre V.: *See*—
Harvey, John D.; and Gindre, Andre V., 4,562,109, Cl. 428-220.000.

Giroldini, William: *See*—
Neri, Carlo; Giroldini, William; Traversoni, Mario; Guizzi, Guido; Perrotti, Emilio; and Rinaldi, Antonio, 4,562,266, Cl. 549-462.000.

Glaab, Joseph B., to General Instrument Corporation. Adaptive video descrambling system. 4,562,465, Cl. 358-120.000.

Gladden, Robert S., Jr.; Johnson, Richard J.; Kidd, John C.; and Younkin, Robert A., to Tate Architectural Products, Inc. Modular tile with positioning means for use with an access floor panel system. 4,561,232, Cl. 52-385.000.

Glantschnig, Josef; and Gugl, Peter, to Zimmer, Johannes. Multiple unit apparatus for the treatment of webs of material. 4,561,354, Cl. 101-120.000.

Glass, Joseph E., Jr., to Union Carbide Corporation. Hec-bentonite compatible blends. 4,561,985, Cl. 252-8.50A.

Glaxo Group Limited: *See*—
Crisp, Harold A.; and Clayton, John C., 4,562,181, Cl. 514-202.000.

Gliemeroth, Georg: *See*—
Mennemann, Karl; Gliemeroth, Georg; Ross, Ludwig; Speit, Burkhard; Geiler, Volkmar; Krolla, Hans-Georg; and Meckel, Lothar, 4,562,161, Cl. 501-59.000.

Glover, Neal; O'Keeffe, Michael J.; and Perera, S. Robert, to Storage Technology Partners II. Shared encoder/decoder circuits for use with error correction codes of an optical disk system. 4,562,577, Cl. 371-38.000.

Glyco-Metall-Werke, Daelen & Loos GmbH: *See*—
Hodes, Erich; Lippok, Peter; and Miotk, Bernd, 4,562,122, Cl. 428-644.000.

Gneiss, Heinz: *See*—
Sumal, Jaihind S.; and Gneiss, Heinz, 4,561,302, Cl. 73-202.000.

Gobel, Herbert; and Kopl, Rupert, to Siemens Aktiengesellschaft. Sequential x-ray crystal spectrometer. 4,562,585, Cl. 378-83.000.

Goddard, John B.; and Merkert, Rodney F., to Union Carbide Corporation. Preparation of low-carbon vanadium nitride. 4,562,057, Cl. 423-409.000.

Goebel, Franz; Haskins, Timothy B.; and Batson, David C., to GTE Government Systems Corporation. Method of manufacturing porous carbon structures. 4,562,094, Cl. 427-115.000.

Goehring, Richard A.: *See*—
Spaulding, Mark F.; and Goehring, Richard A., 4,561,808, Cl. 406-118.000.

Goel, Anil B.; and Tufts, Timothy A., to Ashland Oil, Inc. Bicyclic amide acetal/polyol/polyisocyanate polymers. 4,562,240, Cl. 528-73.000.

Goetz, Fred E.; Harris, Jim C.; and Howell, Steven E., to International Business Machines Corp. Tiltable cathode ray tube display device structure. 4,561,620, Cl. 248-371.000.

Goff, Jerry K.; Marinko, Joseph A., Jr.; Venditto, Joseph G., Jr.; and Yost, Donald A., to Performance Controls Company. Current sense demodulator. 4,562,386, Cl. 318-254.000.

Goffinet, Pierre C. E.: *See*—
Wertz, Jean-Luc H. M.; and Goffinet, Pierre C. E., 4,561,998, Cl. 252-547.000.

Gold, Stanley; Newman, Robert; and Lavigne, Eric, to Defender Energy of Connecticut, Inc. Panel fastener system and retaining member. 4,561,223, Cl. 52-202.000.

Goldman, Stuart O.; Lissakers, Erik A.; and Thomson, Matthew W. S., to International Telephone and Telegraph Corporation. Cellular mobile radio service telephone system. 4,562,572, Cl. 370-80.000.

Goldstein, David, to United States of America, Navy. Padlock shackle. 4,561,272, Cl. 70-417.000.

Golembek, Joe M.: *See*—
Loechner, John T.; Kruger, Kurt J.; Nottingham, John R.; and Golembek, Joe M., 4,561,416, Cl. 126-21.00A.

Goliasch, Karl; Muller, Herbert; and Pelster, Heinrich, to Bayer Aktiengesellschaft. Process for the preparation of benzoic anhydride. 4,562,010, Cl. 260-546.000.

Gono, Takeshi: *See*—
Niwa, Takao; Gono, Takeshi; and Osanai, Akinori, 4,561,327, Cl. 74-866.000.

Goodby, John W.; Leslie, Thomas M.; and Patel, Jayantilal S., to AT&T Bell Laboratories. Alignment of ferroelectric LCDs. 4,561,726, Cl. 350-341.000.

Goodenough, William G.: *See*—
Becka, Michael M.; and Goodenough, William G., 4,561,139, Cl. 12-1.00R.

Goodyear Tire & Rubber Company, The: *See*—
Harvey, John D.; and Gindre, Andre V., 4,562,109, Cl. 428-220.000.
Olsen, Roy W.; and Bell, Curtis H., 4,561,838, Cl. 425-387.100.
Rossi, Robert K., 4,562,031, Cl. 264-255.000.

Gorenje Tovarna Gospodinjske Opreme N.Sol. O. Velenje: *See*—
Skerjanec, Joze; and Pocivalnik, Stane, 4,561,925, Cl. 156-379.600.

Goritz, Bernd; Huber, Johann; and Meinicke, Peter, to Knorr-Bremse GmbH. Selector valve for a pressure control device in a railway vehicle air brake system. 4,561,700, Cl. 303-36.000.

Gottesman, Martin, to General Foods Corporation. Decaffeination of green coffee with n-butyl acetate. 4,562,083, Cl. 426-424.000.

Goulart, Joseph S.: *See*—
Orlando, Franklin P.; Goulart, Joseph S.; and Chandra, Rangasami S., 4,561,299, Cl. 73-151.000.

Goussinsky, Doron. Propulsion means for hoisting systems. 4,561,551, Cl. 212-131.000.

Grab, George D.; and Dean, Sheldon W., to Air Products and Chemicals, Inc. Process for the removal of nitrogen oxides from nitric acid plant tail gas. 4,562,052, Cl. 423-235.000.

Graco Robotics, Inc.: *See*—
Fender, Norman N.; and Davis, Mark S., 4,561,592, Cl. 239-587.000.

Graham, Charles R.: *See*—
Wrobleski, James T.; Edwards, James W.; Graham, Charles R.; Keppel, Robert A.; and Raffelson, Harold, 4,562,268, Cl. 549-259.000.

Graham, Kenneth W.; Norton, Edward J.; and Kurata, Shuhei, to New Balance Athletic Shoe, Inc. Sole construction for footwear. 4,561,140, Cl. 12-146.0BR.

Graham, Timothy J., to Sencore, Inc. Method and apparatus for aligning traps in a television receiver. 4,562,469, Cl. 358-139.000.

Grati, Giorgio, to Ograd s.r.l. Hollow punched object for forming a structure with box walls. 4,561,706, Cl. 312-258.000.

Graves, Charles W., to Phillips Petroleum Company. In situ recovery of mineral values. 4,561,696, Cl. 299-4.000.

Graves, Nancy D.: *See*—
Chen, John; Huang, Chin; Graves, Nancy D.; and Hicks, James E., 4,562,508, Cl. 361-91.000.

Graves, Victoria, to Exxon Research & Engineering Co. Polymerization catalyst. 4,562,170, Cl. 502-113.000.

Gray, John D., to Ex-Cell-O Corporation. Mold method and apparatus for multi-color plastic shells. 4,562,025, Cl. 264-126.000.

Gray Tool Company: *See*—
Dickson, James; and Hays, Charles, 4,562,090, Cl. 427-34.000.

Green, Alex E. S.; and Green, Bruce A. S., to University of Florida. Method of retrofitting an oil-fired boiler to use coal and gas combustion. 4,561,364, Cl. 110-347.000.

Green, Brian N.: *See*—
Atherton, Paul; Burns, Peter; and Green, Brian N., 4,562,351, Cl. 250-288.000.

Green, Bruce A. S.: *See*—
Green, Alex E. S.; and Green, Bruce A. S., 4,561,364, Cl. 110-347.000.

Green, Donald R.: *See*—
Panayotou, Nicholas F.; Green, Donald R.; and Price, Larry S., 4,562,037, Cl. 376-340.000.

Greene & Kellogg, Inc.: *See*—
McCombs, Norman R.; and Bansal, Ravinder K., 4,561,865, Cl. 55-25.000.

Greene, Lindsey C.: *See*—
DeWitt, Nick; and Greene, Lindsey C., 4,561,671, Cl. 280-404.000.

Gregg, James R.: *See*—
Bachmann, Henry C.; Brown, Omar L.; Fraze, Ermal C.; Gregg, James R.; and Wynn, David K., 4,561,280, Cl. 72-346.000.

Greive, Aloys; and Leuthold, Dieter, to Saurer-Allma GmbH. Bobbin holder. 4,561,600, Cl. 242-18.0DD.

Grenon, Rene E. Variable length guide device for a pushed wire. 4,561,349, Cl. 100-26.000.

Grinde, James E., to Yamaha Hatsudoki Kabushiki Kaisha. Recreational vehicle with limited differential. 4,561,518, Cl. 180-215.000.

Gris, Yvon; and Monroy, Agustin, to Societe pour l'Etude et la Fabrication de Circuits Integres Speciaux E.F.C.I.S. Method of producing integrated silicon structures on isolated islets of the substrate. 4,561,932, Cl. 156-643.000.

GRM Industries, Inc.: *See*—
Jelens, David P., 4,561,224, Cl. 52-207.000.

Grotnes Metalforming Systems, Inc.: *See*—
Tan, Archie; and Fencl, Vernon R., 4,562,326, Cl. 219-59.100.

Grumman Aerospace Corp.: *See*—
Arena, Aldo, 4,561,799, Cl. 403-285.000.
Salvia, Frank, 4,562,457, Cl. 358-19.000.

Grundler, Bruno, to SIG Schweizerische Industrie Gesellschaft. Apparatus for dispensing bulk goods. 4,561,572, Cl. 222-410.000.

Grundstrom, Douglas R.: *See*—
Hovey, Dean A.; Grundstrom, Douglas R.; and Yurchenco, James R., 4,562,347, Cl. 250-221.000.

GTE Communication Systems Corporation: *See*—
Zrnich, Milan, 4,561,711, Cl. 339-17.00C.

GTE Government Systems Corporation: *See*—
Goebel, Franz; Haskins, Timothy B.; and Batson, David C., 4,562,094, Cl. 427-115.000.

Guagliumi, Renato; and Blazic, Oscar, to Marelli Autronica S.p.A. Diagnostic device for a system for controlling the stopping and restarting of a internal combustion engine for motor vehicles. 4,561,296, Cl. 73-118.000.

Gude, Fritz; and von Praun, Ferdinand, to Chemische Werke Huls Aktiengesellschaft. Process for the recovery of five-membered ring dicarboxylic acid anhydrides. 4,562,264, Cl. 549-261.000.

Gueret, Jean-Louis H., to Joint Stock Company "L'Oreal" The. Eyelash brush and method and apparatus for manufacturing same. 4,561,456, Cl. 132-88.700.

Guerguerian, Rhual L.: *See—*
Shaver, Marvin B.; and Guerguerian, Rhual L., 4,561,599, Cl. 241-34.000.

Guess, Hal E., to R. J. Reynolds Tobacco. Smoking article having reduced sidestream smoke. 4,561,454, Cl. 131-365.000.

Gugl, Peter: *See—*
Glantschnig, Josef; and Gugl, Peter, 4,561,354, Cl. 101-120.000.

Gugliermotte, Francis: *See—*
Alary, Jean-Andre ; Cot, Louis; Gugliermotte, Francis; Larbot, Andre ; and Guizard, Christian, 4,562,021, Cl. 264-43.000.

Guillou, Francoise: *See—*
Le Creff, Michel; Guillou, Francoise; and Buhagiar, Francois, 4,562,309, Cl. 179-90.00R.

Guizard, Christian: *See—*
Alary, Jean-Andre ; Cot, Louis; Gugliermotte, Francis; Larbot, Andre ; and Guizard, Christian, 4,562,021, Cl. 264-43.000.

Guizzi, Guido: *See—*
Neri, Carlo; Giroldini, William; Traversoni, Mario; Guizzi, Guido; Perrotti, Emilio; and Rinaldi, Antonio, 4,562,266, Cl. 549-462.000.

Gulley, Brian W.; Williamson, Gilbert J.; Carmichael, Richard Q.; Cooke, David F.; and Taylor, Roderick, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for the Environment in Her Britannic Majesty's Government of the. Process and apparatus for production of refuse derived fuel. 4,561,860, Cl. 44-10.00R.

Gully, John H.: *See—*
Weldon, William F.; Gully, John H.; and Walls, William A., 4,562,368, Cl. 310-178.000.

Gunther, Termath: *See—*
Mario, Roth; and Gunther, Termath, 4,562,093, Cl. 427-109.000.

Gunzenhauser, Sigmund: *See—*
Balli, Heinz; Gunzenhauser, Sigmund; Fletcher, Ian J.; and Bedekovic, Davor, 4,562,449, Cl. 346-218.000.

Gustav Dabringhaus Revocable Trust: *See—*
Dabringhaus, Gustav H., 4,561,703, Cl. 308-6.00C.

Gwinner, Dietrich; Merkle, Roland; and Noltemeyer, Friedrich, to Daimler-Benz Aktiengesellschaft. Cylinder block for an air-compressing internal combustion engine. 4,561,388, Cl. 123-41.740.

Gyi, Ko K., to MegaTape Corporation. Tape cartridge loading apparatus. 4,561,610, Cl. 242-198.000.

H. Kuhnke GmbH KG: *See—*
Klocke, Harald; and Thomsen, Uwe H., 4,561,344, Cl. 91-358.00A.

Haarmann & Reimer GmbH: *See—*
Hopp, Rudolf; Finkelmeier, Horst; and Langner, Roland, 4,562,067, Cl. 424-59.000.

Habermann, Helmut; and Brunet, Maurice, to Societe Europeenne de Propulsion. Device for measuring the longitudinal tension in a strip of material. 4,561,313, Cl. 73-862.070.

Hacker, Wolfgang, to Fred Vatter Strumpffabriken Schongau-Altenstadt GmbH. Method for knitting stockings. 4,561,266, Cl. 66-51.000.

Hackney, John. Protective caps for sailboat spreaders. 4,561,373, Cl. 114-89.000.

Haddad, James H.: *See—*
Owen, Hartley; Haddad, James H.; and Zahner, John C., 4,561,966, Cl. 208-11.00R.

Hadden, Edward L., Sr. Diminishing arm toggle linkage. 4,561,282, Cl. 72-410.000.

Hader, Helmut. Dental anchoring for attachment of dental prostheses to crowns, pivot teeth, bridges, and splint elements. 4,561,847, Cl. 433-182.000.

Hafner, William E. Support device for displaying objects. 4,561,617, Cl. 248-121.000.

Hagerty, Robert O.; Petsche, Irena B.; and Schurzky, Kenneth G., to Mobil Oil Corporation. Alpha-olefins polymerization catalyst of high productivity. 4,562,169, Cl. 502-107.000.

Hagiwara, Yoshimune: *See—*
Takagi, Katsuaki; Kita, Yuzo; Hagiwara, Yoshimune; Torii, Shuichi; and Ogawa, Kazuyoshi, 4,562,424, Cl. 340-347.0NT.

Hagyuda, Nobuyoshi, to Nippon Kogaku K.K. Flash device. 4,561,751, Cl. 354-418.000.

Haiges, Adolf, to Suevia Haiges GmbH & Co. Valve for animal watering tanks. 4,561,633, Cl. 251-339.000.

Hajek, Manfred; Muller, Hanns P.; and Rasshofer, Werner, to Bayer Aktiengesellschaft. Homogeneous storage stable cyanamide solutions in polyols and a process for their production. 4,562,289, Cl. 564-2.000.

Hakamata, Yoshiro: *See—*
Tokura, Nobuyuki; Hakamata, Yoshiro; and Oguchi, Kimio, 4,562,582, Cl. 375-87.000.

Hakiri, Minoru: *See—*
Watanabe, Hideo; Hakiri, Minoru; Kawasaki, Kanjirou; Kubo, Keishi; and Takigawa, Nobuhiro, 4,562,448. Cl. 346-208.000.

Hall, James E.: *See—*
Kang, Jung W.; and Hall, James E., 4,562,172, Cl. 502-117.000.

Hall, Walter J.; and O'Leary, Raymond P., to S&C Electric Company. Electrical contact for use in a current-interrupting unit. 4,562,324, Cl. 200-260.000.

Halters, M. A. M.; and Verwijmeren, A. S., to Eurogrill B.V. Apparatus for grilling meat or the like. 4,561,348, Cl. 99-421.00H.

Hamabe, Takafumi; Imai, Hirozo; and Hara, Hikoyoshi, to Matsushita Electric Works, Ltd. Friction drive planetary roller type speed reducer. 4,561,326, Cl. 74-798.000.

Hamada, Seiji: *See—*
Mishiro, Shoji; and Hamada, Seiji, 4,562,413, Cl. 331-116.00R.

Hamano, Nobuo; and Matsumoto, Kazumi, to Tomy Kogyo Co., Inc. Electronic stereoscopic viewing device. 4,561,723, Cl. 350-331.00R.

Hamilton, Billy H.: *See—*
Andersen, Brad E.; Hamilton, Billy H.; and Schroeder, Robert E., 4,562,548, Cl. 364-483.000.

Hamilton, Rodrick J., to Digimetrics, Inc. Spot weld quality monitoring system. 4,562,330, Cl. 219-110.000.

Hamisch, Paul H., Jr.; and Mistyurik, John D., to Monarch Marking Systems, Inc. Labeler. 4,561,926, Cl. 156-381.000.

Hammer, Edward E.; and Lemmers, Eugene, to General Electric Company. Starting circuit for multiple fluorescent lamps. 4,562,381, Cl. 315-99.000.

Hammock, Bruce D.; and Mullin, Christopher A., to University of California, The Regents of the. Trifluoromethylketone sulfides and reversible enzyme inhibition therewith. 4,562,292, Cl. 568-043.000.

Hamprecht, Gerhard: *See—*
Varwig, Jurgen; Hamprecht, Gerhard; and Rohr, Wolfgang, 4,562,254, Cl. 544-92.000.

Hanaoka, Masanori, to Toyota Jidosha Kabushiki Kaisha. Tamperproof clamping construction with block wedged in slot. 4,561,796, Cl. 403-4.000.

Hani, Franz: *See—*
Wolff, Horst; and Hani, Franz, 4,561,828, Cl. 417-307.000.

Hannebaum, Heinz: *See—*
Laas, Harald; Tavs, Peter; Hannebaum, Heinz; and Stroezel, Manfred, 4,562,277, Cl. 556-34.000.

Hansen, Kenneth A.; and Kurtzman, Gary A., to Motorola, Inc. Multiplexed buffer. 4,562,405, Cl. 330-51.000.

Hanson, Gary R.: *See—*
Rabuse, George R.; and Hanson, Gary R., 4,562,102, Cl. 428-43.000.

Hanssler, Gerd: *See—*
Elbe, Hans-Ludwig; Jautelat, Manfred; Buchel, Karl H.; Brandes, Wilhelm; Hanssler, Gerd; and Reinecke, Paul, 4,562,198, Cl. 514-383.000.

Hara, Hikoyoshi: *See—*
Hamabe, Takafumi; Imai, Hirozo; and Hara, Hikoyoshi, 4,561,326, Cl. 74-798.000.

Hara, Masanori; and Sugawara, Sakuo, to Mitsubishi Denki Kabushiki Kaisha. Hot air type heater. 4,561,422, Cl. 126-110.00R.

Harada, Hisashi: *See—*
Uzaki, Nagato; Kawamura, Yasutaro; Kanayama, Ryoji; and Harada, Hisashi, 4,561,485, Cl. 164-201.000.

Harada, Shigeo, to Fuji Photo Film Co., Ltd. Light beam modulating and deflecting system. 4,562,579, Cl. 372-26.000.

Harada, Shooichi; and Ohtake, Matsuo, to Fuji Seiki Machine Works Ltd. Process and apparatus for finishing electronic device. 4,561,219, Cl. 51-319.000.

Harbridge, John B.; and Stirling, Irene, to Beecham Group p.l.c. Compounds containing beta-lactams. 4,562,182, Cl. 514-210.000.

Harder, Christoph: *See—*
Yariv, Amnon; Harder, Christoph; and Lau, Kam-Yin, 4,562,569, Cl. 369-122.000.

Hargis, Duane C., to Ethyl Corporation. Production of aldehydes and ketones. 4,562,296, Cl. 568-388.000.

Harman, Maurice: *See—*
Cross, Henry F.; and Harman, Maurice, 4,561,385, Cl. 122-4.00D.

Harman, R. Keith; and Younge, Dale R., to Senstar Security Systems Corp. Intrusion detector. 4,562,428, Cl. 340-552.000.

Harms, John F.; and Harms, John F., II, to Harmsco, Inc. Single cartridge filter. 4,561,979, Cl. 210-438.000.

Harms, John F., II: *See—*
Harms, John F.; and Harms, John F., II, 4,561,979, Cl. 210-438.000.

Harmsco, Inc.: *See—*
Harms, John F.; and Harms, John F., II, 4,561,979, Cl. 210-438.000.

Harnden, John D., Jr.: *See—*
Alley, Robert P.; Harnden, John D., Jr.; and Kornrumpf, William P., 4,561,314, Cl. 73-862.690.

Harris Corporation: *See—*
Bostrom, Mark W., 4,561,687, Cl. 294-64.100.

Harris, Jim C.: *See—*
Goetz, Fred E.; Harris, Jim C.; and Howell, Steven E., 4,561,620, Cl. 248-371.000.

Harris, Richard H.: *See—*
Evans, Vaughn R.; Harris, Richard H.; Thorpe, Allan C.; and Watts, John E., 4,561,790, Cl. 400-124.000.

Harrison, Arnold M.; and Kaplan, Leonard, to Union Carbide Corporation. Process for preparing cyclic polyethers. 4,562,272, Cl. 549-352.000.

Harte, J. Richard. Computer assisted teaching machine that uses two electroresistive sheets. 4,561,852, Cl. 434-339.000.

Harter, James W.; and Smagiel, Gary S., to Butler Manufacturing Company. Wall panel. 4,561,233, Cl. 52-588.000.

Harvey, John D.; and Gindre, Andre V., to Goodyear Tire & Rubber Company, The. Crack resistant coating for masonry structures and process for applying same. 4,562,109, Cl. 428-220.000.

Harvey, Kenneth: *See—*
Hayes, Harry; and Harvey, Kenneth, 4,562,063, Cl. 424-49.000.
Hayes, Harry; and Harvey, Kenneth, 4,562,065, Cl. 424-49.000.
Hayes, Harry; and Harvey, Kenneth, 4,562,066, Cl. 424-52.000.

Harwood, Leopold A., to RCA Corporation. Manual hue control as for a digital TV. 4,562,460, Cl. 358-28.000.

Hasebe, Nobuyuki: *See—*
Kondo, Kiyohiro; Sugawara, Hiroshi; and Hasebe, Nobuyuki, 4,562,238, Cl. 528-18.000.

Hasegawa, Taiji, to Hitachi, Ltd. Method of taking-in input data for motorcar control. 4,562,545, Cl. 364-431.120.

Hashimoto, Akio; and Yasuda, Tomio, to Aisin Seiki Kabushiki Kaisha. Steering power transmitting equipment. 4,561,515, Cl. 180-79.100.

Hashimoto, Akira: *See*—
Kataoka, Keiji; Saito, Susumu; Arimoto, Akira; Hashimoto, Akira; and Tatsuno, Kimio, 4,561,717, Cl. 350-6.800.

Hashimoto, Masahiro; and Tani, Hideo, to Kabushiki Kaisha Toshiba; and Osaka Kongo Seito Co. Grinding wheel and manufacturing method thereof. 4,561,863, Cl. 51-295.000.

Hashimoto, Shinsuke: *See*—
Wakatsuka, Hirohisa; Yamato, Takashi; and Hashimoto, Shinsuke, 4,562,204, Cl. 514-530.000.

Hashimoto, Yutaka, to Toshiba Kikai Kabushiki Kaisha. Multiple control valve system. 4,561,462, Cl. 137-596.130.

Hashizume, Hiroshi; and Izumisawa, Yoshiaki, to Mitsubishi Chemical Industries Limited. Process for producing terephthalic acid. 4,562,285, Cl. 562-414.000.

Haskins, Timothy B.: *See*—
Goebel, Franz; Haskins, Timothy B.; and Batson, David C., 4,562,094, Cl. 427-115.000.

Hata, Yoshitaka; and Morita, Tatsuo, to Nissan Motor Company, Limited. Air-fuel ratio control system. 4,561,401, Cl. 123-486.000.

Hatakenaka, Toshiki; Akiyama, Tetsuo; Asada, Shinji; and Shinohara, Kunio, to Chugai Ro Co., Ltd.; and Kajima Road Co., Ltd. Method of heating a road surface and apparatus therefor. 4,561,800, Cl. 404-79.000.

Hatakoshi, Makoto: *See*—
Nishida, Sumio; Matsuo, Noritada; Tsushima, Kazunori; Hatakoshi, Makoto; and Hirano, Masachika, 4,562,213, Cl. 514-721.000.

Hatrick Industries Limited: *See*—
Norton, Harry W., 4,561,823, Cl. 414-678.000.

Hattori, Kyo: *See*—
Idogaki, Takaharu; Hayashi, Ikuo; Kawai, Hisasi; Hattori, Kyo; and Sakurai, Kazuhiro, 4,561,629, Cl. 251-65.000.

Hattori, Masayuki; Nakamura, Shigeo; and Yairo, Osamu, to Fanuc Ltd. Power switching transistor drive circuit. 4,562,361, Cl. 307-270.000.

Hattori, Motonobu: *See*—
Mutoh, Nobuyoshi; Sakai, Keijiro; Hattori, Motonobu; and Nagato, Yuichiro, 4,562,524, Cl. 363-41.000.

Hattori, Shinichiro: *See*—
Sato, Ken; Takahashi, Yutaka; Tsukaya, Takashi; Kato, Shinichi; and Hattori, Shinichiro, 4,561,429, Cl. 128-6.000.

Hattori, Takashi, to Toyota Jidosha Kabushiki Kaisha. Method of controlling air-fuel ratio. 4,561,400, Cl. 123-478.000.

Hattori, Takashi: *See*—
Kobayashi, Nobuyuki; and Hattori, Takashi, 4,561,399, Cl. 123-478.000.

Haug, Theobald: *See*—
Darms, Roland; Beyeler, Harry; and Haug, Theobald, 4,562,119, Cl. 428-458.000.

Haury, Andre : *See*—
Belbel, Elie; Blanchard, Christian; Haury, Andre ; and Lauraire, Michel, 4,562,323, Cl. 200-151.000.

Hauschopp, Alois, to Gewerkschaft Eisenhutte Westfalia. Guides for mineral mining. 4,561,697, Cl. 299-43.000.

Hausinger, Otto, to Dr. Ing. h.c.F. Porsche Aktiengellschaft. Motor vehicle transmission. 4,561,322, Cl. 74-475.000.

Hayashi, Asao; Oinoue, Kenichi; Aoki, Masahiro; and Ida, Masatoshi, to Olympus Optical Company Limited. Apparatus and method for detecting focus condition of imaging optical system employing both sharpness detection and lateral shift detection. 4,562,346, Cl. 250-201.000.

Hayashi, Asao: *See*—
Aoki, Masahiro; Nakamura, Junichi; Ida, Masatoshi; Oinoue, Kenichi; and Hayashi, Asao, 4,562,345, Cl. 250-201.000.

Hayashi, Ikuo: *See*—
Idogaki, Takaharu; Hayashi, Ikuo; Kawai, Hisasi; Hattori, Kyo; and Sakurai, Kazuhiro, 4,561,629, Cl. 251-65.000.

Hayashi, Nobuyuki: *See*—
Kakumaru, Hajime; and Hayashi, Nobuyuki, 4,562,142, Cl. 430-288.000.

Hayashi, Shinobu: *See*—
Miyaoka, Shinichiro; Sekozawa, Teruji; Funabashi, Motohisa; and Hayashi, Shinobu, 4,562,552, Cl. 364-510.000.

Hayes, Harry; and Harvey, Kenneth, to Colgate-Palmolive Company. Astringent gel dentifrice. 4,562,063, Cl. 424-49.000.

Hayes, Harry; and Harvey, Kenneth, to Colgate-Palmolive Company. Astringent dentifrice. 4,562,065, Cl. 424-49.000.

Hayes, Harry; and Harvey, Kenneth, to Colgate-Palmolive Company. Astringent dentifrice containing monofluorophosphate. 4,562,066, Cl. 424-52.000.

Hays, Charles: *See*—
Dickson, James; and Hays, Charles, 4,562,090, Cl. 427-34.000.

Hays, George E.; Nielsen, Richard H.; Bowen, Chester O.; and Holland, Floyd H., to Phillips Petroleum Company. Catalytic cracking unit. 4,562,046, Cl. 422-140.000.

Haza, Robert R., to Haza, Robert R.; and Prestia, Joseph, a part interest to each. Device for adjusting the diameter of bowling ball holes. 4,561,654, Cl. 273-63.00B.

Hazel, Robert L.; and Chan, Gilbert Y., to Burroughs Corporation. Beam combining and separating apparatus useful for combining and separating reading and writing laser beams in an optical storage system. 4,562,568, Cl. 369-112.000.

Hazemeijer B.V.: *See*—
van der Scheer, Derk, 4,562,320, Cl. 200-144.00R.

Healy, Francis E.: *See*—
Slegeir, William A.; Healy, Francis E.; and Sapienza, Richard S., 4,561,859, Cl. 44-1.0SR.

Hedges, Charles V.: *See*—
Mark, Victor; and Hedges, Charles V., 4,562,242, Cl. 528-193.000.

Heeks, John S.; and Cooke, Roger E., to International Standard Electric Corporation. Two-dimensional acousto-optic deflection arrangement. 4,561,727, Cl. 350-351.000.

Hegasy, Ahmed; Rupp, Roland; Ramsch, Klaus-Dieter; and Luchtenberg, Helmut, to Bayer Aktiengesellschaft. Two-phase formulation. 4,562,069, Cl. 424-80.000.

Hehn, Bruce A., to Alpha Enterprises, Inc. Display device. 4,561,200, Cl. 40-156.000.

Heiba, El-Ahmadi I. Herbicidal N-substituted-5-(substituted-phenoxy)-2-substituted benzoic acid sulphonamides. 4,562,279, Cl. 560-12.000.

Heidelberger Druckmaschinen Aktiengesellschaft: *See*—
Pollich, Gerhard, 4,561,645, Cl. 271-195.000.

Heimala, Seppo O.; and Saari, Kaarlo M. J., to Outokumpu Oy. Process for the froth flotation of complex metal compounds. 4,561,970, Cl. 209-3.000.

Heimburger, Norbert; Kumpe, Gerhardt; Wormsbacher, Wilfried; and Preis, Hans M., to Behringwerke Aktiengesellschaft. Process for the pasteurization of antihemophilic cryoprecipitate (AHC) and antihemophilic cryoprecipitate prepared thereby. 4,562,072, Cl. 424-101.000.

Heimler, Horst. Preheating device. 4,562,336, Cl. 219-282.000.

Hein, Hans C.: *See*—
Domic, Esteban M.; and Hein, Hans C., 4,561,887, Cl. 75-65.00R.

Heinz, Jutta; Sautter, Helmut; Schink, Rainer; and Weber, Lothar, to Robert Bosch GmbH. Counterelectrode for an electrochromic indicating device. 4,561,729, Cl. 350-357.000.

Heinzel, Eberhard. Folding table catch. 4,561,622, Cl. 248-439.000.

Helmers, Thomas L.: *See*—
O'Gwynn, David C.; and Helmers, Thomas L., 4,561,608, Cl. 242-186.000.

Hempel, Hans-Ulrich; Novotny, Rudolf; Staller, Siegfried; and Kramer, Johannes, to Henkel Kommanditgesellschaft auf Aktien. Modification of deposit formation in glass furnace heat recovery. 4,561,873, Cl. 65-27.000.

Heng, Jean-Paul: *See*—
Borne, Andre ; and Heng, Jean-Paul, 4,561,712, Cl. 339-33.000.

Henkel Corporation: *See*—
Peerman, Dwight E.; and Frisch, Kurt C., 4,561,922, Cl. 156-331.400.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Fehr, Hans; Pesch, Wolfgang; and Friedemann, Wolfgang, 4,561,898, Cl. 106-74.000.
Hempel, Hans-Ulrich; Novotny, Rudolf; Staller, Siegfried; and Kramer, Johannes, 4,561,873, Cl. 65-27.000.
Moller, Hinrich; and Wallat, Siegfried, 4,562,068, Cl. 424-70.000.

Henning, Rainer: *See*—
Urbach, Hansjorg; Henning, Rainer; Teetz, Volker; Wissmann, Hans; and Becker, Reinhard, 4,562,202, Cl. 514-423.000.

Herbots, Ivan; Johnston, James P.; and Walker, John R., to Procter & Gamble Company, The. Fabric cleaning compositions for clay-based stains. 4,561,991, Cl. 252-118.000.

Hergenrother, William L., to Firestone Tire & Rubber Company, The. Composites and size coated glass fibers used therein. 4,562,115, Cl. 428-392.000.

Hering, Reinhard F. Weather resistant boards. 4,562,103, Cl. 428-76.000.

Hertler, Eberhard: *See*—
Enke, Kurt; Hespelt, Achim; Hertler, Eberhard; von der Ohe, Manfred; and Saftien, Udo, 4,561,640, Cl. 267-20.00A.

Herzig, Peter, to BBC Brown, Boveri & Company, Limited. Switching arrangement for electrical installations. 4,562,359, Cl. 307-113.000.

Herzing, Anthony G., to SCM Corporation. Hard butter savory coatings. 4,562,079, Cl. 426-94.000.

Hespelt, Achim: *See*—
Enke, Kurt; Hespelt, Achim; Hertler, Eberhard; von der Ohe, Manfred; and Saftien, Udo, 4,561,640, Cl. 267-20.00A.

Hettinger, William P., Jr.: *See*—
Beck, H. Wayne; Carruthers, James D.; Cornelius, Edward B.; Kmecak, Ronald A.; Kovach, Stephen M.; and Hettinger, William P., Jr., 4,561,968, Cl. 208-120.000.

Hetz, Walter, to Siemens Aktiengesellschaft. Ultrasonic probe which can be introduced into a body. 4,561,446, Cl. 128-660.000.

Hicks, James E.: *See*—
Chen, John; Huang, Chin; Graves, Nancy D.; and Hicks, James E., 4,562,508, Cl. 361-91.000.

Hieber, Konrad; and Mayer, Norbert, to Siemens Aktiengesellschaft. Method of measuring electric resistance of thin metallic layers manufactured under the influence of a plasma. 4,562,089, Cl. 427-10.000.

Highway Equipment Company: *See*—
Kampman, Lester R., 4,561,594, Cl. 239-658.000.

Higurashi, Seiji, to Victor Company of Japan, Limited. Noise reduction circuit. 4,562,492, Cl. 360-65.000.

Hijiya, Hiromi; and Miyake, Toshio, to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo. Process for producing self-supporting glucan film. 4,562,020, Cl. 264-39.000.

Hildner, Ernest: *See*—
Hoover, Richard B.; and Hildner, Ernest, 4,562,583, Cl. 378-43.000.

Hill, Alfred D.: *See*—
Norton, Charles J.; Falk, David O.; and Hill, Alfred D., 4,561,502, Cl. 166-274.000.

Hill, Kevin E., to Milsco Manufacturing Company. Tiltable vehicle seat for backhoes or the like. 4,561,621, Cl. 248-397.000.

Hill, Michael P., to Dow Corning, Ltd. Organosilicon compounds and preparation and use thereof. 4,562,278, Cl. 556-418.000.

Hilse, Gernot R. K.; Intlekofer, Michael J.; and Auth, David C., to Advanced Technology Laboratories, Inc. Push-pull material transport system for improved two-phase flow. 4,561,807, Cl. 406-99.000.

Hilton, Carl W.; and Bullard, Harold L., to Return on Investment Corporation. Cruise control modulator. 4,561,517, Cl. 180-175.000.

Hinchcliffe, Dennis, to Molins PLC. Apparatus for applying adhesive. 4,562,099, Cl. 427-282.000.

Hinden, Milton. Universal strap tightening tool. 4,561,475, Cl. 140-123.500.

Hinenoya, Saburo: *See*—
Fukui, Osamu; Inuizawa, Yoshihiro; Hinenoya, Saburo; and Takasaki, Yasufumi, 4,562,230, Cl. 525-74.000.

Hino, Toshiyuki: *See*—
Saita, Toshikazu; Hino, Toshiyuki; and Matsumura, Masami, 4,561,412, Cl. 123-617.000.

Hintermann, Hans Erich: *See*—
Sekler, Jorg; Zumsteg, Alphonse E.; and Hintermann, Hans Erich, 4,561,286, Cl. 73-23.000.

Hirabayashi, Shigeto; Masukawa, Toyoaki; and Ishikawa, Wataru, to Konishiroku Photo Industry Co., Ltd. Method of forming image by means of heat development. 4,562,143, Cl. 430-353.000.

Hiraishi, Hisashi; Nishihara, Hisakatsu; and Shiokawa, Hiroyuki, to Kubota Ltd. Two-phase stainless cast steel having high corrosion fatigue strength. 4,561,890, Cl. 75-125.000.

Hiramatsu, Takeo. Creeping preventing apparatus in automatic transmission for vehicle. 4,561,328, Cl. 74-869.000.

Hiramitsu, Tetsushi; Sugita, Hiroshi; Ono, Satoshi; and Murase, Zenzaburo, to Toyoda Gosei Co., Ltd. Steering wheel. 4,561,324, Cl. 74-498.000.

Hirano, Masachika: *See*—
Nishida, Sumio; Matsuo, Noritada; Tsushima, Kazunori; Hatakoshi, Makoto; and Hirano, Masachika, 4,562,213, Cl. 514-721.000.

Hirasawa, Kunio: *See*—
Yamaguchi, Motoo; Sone, Isamu; Hirasawa, Kunio; Yoshioka, Yoshio; Nishikawa, Akio; Suzuki, Hiroshi; Sato, Mikio; and Hosokawa, Masao, 4,562,322, Cl. 200-148.00G.

Hirasawa, Yukinori; and Kameda, Osamu, to Casio Computer Co., Ltd. Liquid crystal television receiver. 4,562,478, Cl. 358-236.000.

Hirata, Sadao: *See*—
Maruhashi, Yoshitsugu; Kano, Fumio; Yamada, Muneki; and Hirata, Sadao, 4,562,118, Cl. 428-412.000.

Hirata, Yasufumi; and Yanagisawa, Isao, to Yamanouchi Pharmaceutical Co., Ltd. 2-Guanidinothiazoline compounds, and process for preparing them. 4,562,261, Cl. 548-184.000.

Hirneise, Paul J. Chalking line holder. 4,561,189, Cl. 33-408.000.

Hirose, Naohiro: *See*—
Sasaki, Osamu; Hirose, Naohiro; and Sawada, Kiyoshi, 4,562,131, Cl. 430-58.000.

Hiroyoshi, Kamatani: *See*—
Yamane, Noriomi; Arimatsu, Yoshikazu; Katsuo, Kenichi; Saitoh, Minoru; Tani, Katsya; Mitamura, Hideyuki; and Hiroyoshi, Kamatani, 4,562,239, Cl. 528-65.000.

Hirschbuehler, Kevin, to American Cyanamid. Curable epoxy resin compositions. 4,562,217, Cl. 523-466.000.

Hirt, Adam: *See*—
Buchschmid, Emil; Gademann, Lothar; Hirt, Adam; Huttinger, Manfred; Jahn, Hans P.; Orova, Josef; Schmid, Hans-Dieter; and Steffen, Horst-Gunter, 4,561,410, Cl. 123-599.000.

Hitachi Cable Ltd.: *See*—
Nakajima, Tadakatsu; Nakayama, Wataru; Daikoku, Takahiro; Kuwahara, Heikichi; Yasukawa, Akira; Kasuya, Katsuhiko; Yokoi, Kazuaki; Nakae, Hideo; and Yoshida, Hiromichi, 4,561,497, Cl. 165-133.000.

Hitachi Chemical Company, Ltd.: *See*—
Kakumaru, Hajime; and Hayashi, Nobuyuki, 4,562,142, Cl. 430-288.000.

Hitachi Construction Machinery Co., Ltd.: *See*—
Aoyagi, Yukio; Izumi, Eiki; Yamaguchi, Takesh.; and Tanaka, Sotaro, 4,561,250, Cl. 60-430.000.

Hitachi Control Systems Inc.: *See*—
Miyaoka, Shinichiro; Sekozawa, Teruji; Funabashi, Motohisa; and Hayashi, Shinobu, 4,562,552, Cl. 364-510.000.

Hitachi Koki Co, Ltd.: *See*—
Kataoka, Keiji; Saito, Susumu; Arimoto, Akira; Hashimoto, Akira; and Tatsuno, Kimio, 4,561,717, Cl. 350-6.800.

Hitachi, Ltd.: *See*—
Hasegawa, Taiji, 4,562,545, Cl. 364-431.120.
Iwata, Hiroshi; Takebayashi, Masahiro; Sakazume, Akio; Uneyama, Yoshihisa; Sekigami, Kazuo; Tagawa, Shigetaro; and Sugiyama, Masahiko, 4,561,829, Cl. 417-368.000.
Kataoka, Keiji; Saito, Susumu; Arimoto, Akira; Hashimoto, Akira; and Tatsuno, Kimio, 4,561,717, Cl. 350-6.800.
Kitabayashi, Yukio; Takahashi, Noriyoshi; Okuyama, Toshiaki; Watanabe, Masatoshi; and Ohura, Hitoshi, 4,562,397, Cl. 318-814.000.
Koizumi, Hideaki, 4,562,376, Cl. 313-34.000.
Xudo, Hiroyuki; Watanabe, Atsumi; and Sasaki, Hiroshi, 4,562,507, Cl. 361-85.000.
Maeda, Kunihiro; Usami, Katsuhisa; Takeda, Yukio; Ogihara, Satoru; and Asai, Osamu, 4,561,891, Cl. 75-238.000.
Matsuno, Jyunichi; Kawauchi, Masataka; and Yoshida, Masashi, 4,562,443, Cl. 346-76.0PH.
Miyaoka, Shinichiro; Sekozawa, Teruji; Funabashi, Motohisa; and Hayashi, Shinobu, 4,562,552, Cl. 364-510.000.
Miyazaki, Masaru; Takahashi, Susumu; Kohashi, Takahiro; and Ueyanagi, Kiichi, 4,561,169, Cl. 29-571.000.
Mutoh, Nobuyoshi; Sakai, Keijiro; Hattori, Motonobu; and Nagato, Yuichiro, 4,562,524, Cl. 363-41.000.
Nagai, Kenji; and Fujii, Fumiaki, 4,562,408, Cl. 330-253.000.
Nakajima, Tadakatsu; Nakayama, Wataru; Daikoku, Takahiro; Kuwahara, Heikichi; Yasukawa, Akira; Kasuya, Katsuhiko; Yokoi, Kazuaki; Nakae, Hideo; and Yoshida, Hiromichi, 4,561,497, Cl. 165-133.000.
Niyama, Eisuke; and Aizawa, Tatsushi, 4,561,488, Cl. 164-463.000.
Okabe, Nobuya; and Nakagiri, Fumiki, 4,561,824, Cl. 414-697.000.
Ouchi, Yoshiaki; Ishihara, Masamichi; Matsumoto, Tetsuro; and Miyazawa, Kazuyuki, 4,562,555, Cl. 365-233.000.
Oyama, Yoshishige; Fujieda, Mamoru; and Yamauchi, Teruo, 4,561,403, Cl. 123-489.000.
Sakata, Tomoaki, 4,561,825, Cl. 414-753.000.
Shimizu, Toshio; Satou, Takanori; Tsukui, Tsutomu; Doi, Ryouta; and Yamaguchi, Motoo, 4,562,123, Cl. 429-27.000.
Sokei, Hiroichi, 4,562,459, Cl. 358-27.000.
Takagi, Katsuaki; Kita, Yuzo; Hagiwara, Yoshimune; Torii, Shuichi; and Ogawa, Kazuyoshi, 4,562,424, Cl. 340-347.0NT.
Tanaka, Hiromichi; Kimura, Hiroyuki; Noda, Tsutomu; Arai, Takao; Kobayashi, Masaharu; and Inoue, Shigeki, 4,562,549, Cl. 364-486.000.
Tobise, Masahiro, 4,562,390, Cl. 318-490.000.
Umegaki, Kikuo; and Inoue, Kotaro, 4,562,034, Cl. 376-172.000.
Watanabe, Hiroshi; Izumi, Eiki; Aoyagi, Yukio; Honma, Kazuo; and Nakajima, Kichio, 4,561,249, Cl. 60-421.000.
Yamaguchi, Motoo; Sone, Isamu; Hirasawa, Kunio; Yoshioka, Yoshio; Nishikawa, Akio; Suzuki, Hiroshi; Sato, Mikio; and Hosokawa, Masao, 4,562,322, Cl. 200-148.00G.
Yanadori, Michio; Miyamoto, Seigo; and Koike, Keiichi, 4,561,493, Cl. 165-10.000.

Hitachi Microcomputer Engineering Ltd.: *See*—
Ouchi, Yoshiaki; Ishihara, Masamichi; Matsumoto, Tetsuro; and Miyazawa, Kazuyuki, 4,562,555, Cl. 365-233.000.
Takagi, Katsuaki; Kita, Yuzo; Hagiwara, Yoshimune; Torii, Shuichi; and Ogawa, Kazuyoshi, 4,562,424, Cl. 340-347.0NT.

Hixson, Richard M. Rail fastening assembly. 4,561,589, Cl. 238-297.000.

Hobart Corporation: *See*—
Eberhardt, Mark E., Jr., 4,561,904, Cl. 134-18.000.
Treiber, Fritz F., 4,561,921, Cl. 156-297.000.

Hobbs, Milton M.: *See*—
Martens, Alan; Hobbs, Milton M.; and Myers, Gerald A., 4,561,254, Cl. 60-660.000.

Hodel, Alfred; Merkes, Dennis B.; and Chari, Venu, to NCR Corporation. Data communications system to system adapter. 4,562,533, Cl. 364-200.000.

Hodes, Erich; Lippok, Peter; and Miotk, Bernd, to Glyco-Metall-Werke, Daelen & Loos GmbH. Multi-layer plain bearing. 4,562,122, Cl. 428-644.000.

Hoechst Aktiengesellschaft: *See*—
Andra, Klaus; Hutschenruter, Elfriede; and Besier, Horst-Erich, 4,562,101, Cl. 428-36.000.
Busch, Wolfram; Brandrup, Johannes; and Fleischer, Dietrich, 4,562,224, Cl. 524-519.000.
Fischer, Edgar; and Schlingmann, Merten, 4,562,252, Cl. 536-114.000.
Franke, Werner, 4,562,134, Cl. 430-83.000.
Stuhler, Herbert, 4,562,007, Cl. 260-410.600.
Urbach, Hansjorg; Henning, Rainer; Teetz, Volker; Wissmann, Hans; and Becker, Reinhard, 4,562,202, Cl. 514-423.000.
Wiezer, Hartmut, 4,562,220, Cl. 524-95.000.

Hoechst-Roussel Pharmaceuticals Inc.: *See*—
Tegeler, John J.; and Diamond, Craig J., 4,562,186, Cl. 514-238.000.
Tegeler, John J.; and Diamond, Craig J., 4,562,187, Cl. 514-238.000.

Hoffmann, Rudolf H., to Spence Engineering Company. Steam-metering method and apparatus. 4,561,458, Cl. 137-2.000.

Hoffmeister, Lawrence D.; Madderra, Jimmy M.; and Thompson, Richard J., to United States of America, Army. Liquid fuel expulsion system. 4,561,568, Cl. 222-130.000.

Hofmann, Gunter A., to Biotronics. Cooled microscope slide and electrode apparatus for use in live cell fusion system. 4,561,961, Cl. 204-299.00R.

Hogrefe, Arthur F.; and Radford, Wade E., to Johns Hopkins University, The. Coherent inductive communications link for biomedical applications. 4,561,443, Cl. 128-419.0PG.

Hok, Bertil: *See*—
Brogardh, Torgny; Hok, Bertil; and Ovren, Christer, 4,562,348, Cl. 250-231.00R.

Hokazono, Yasuzi: *See*—
Oaku, Takaaki; Hokazono, Yasuzi; Shiota, Masahiko; and Maki, Yoshihiro, 4,561,889, Cl. 75-125.000.

Holbrow, Frederick W.: *See*—
Kelley, Richard L.; and Holbrow, Frederick W., 4,561,371, Cl. 114-61.000.

Hole, Robert W. Weight lifting machine. 4,561,651, Cl. 272-117.000.

Holland, Ernest, to V L Churchill Limited. Hand-held diesel engine injection tester. 4,561,297, Cl. 73-119.00A.

Holland, Floyd H.: *See*—
Hays, George E.; Nielsen, Richard H.; Bowen, Chester O.; and Holland, Floyd H., 4,562,046, Cl. 422-140.000.

Holley Engineering Company, Inc.: *See*—
Holley, John D., 4,561,198, Cl. 37-104.000.

Holley, John D., to Holley Engineering Company, Inc. Method and apparatus for scarifying a railroad crib. 4,561,198, Cl. 37-104.000.

Hollstein, Elmer J.: *See*—
Janoski, Edward J.; and Hollstein, Elmer J., 4,561,969, Cl. 208-262.000.

Holmes, Curtis L.; Faber, William M., Sr.; Francis, Gaylord L.; and Boykin, Otis F., to CTS Corporation. Electrical resistor and method of making the same. 4,561,996, Cl. 252-514.000.

Homeyer, Bernhard: *See*—
Jager, Gerhard; Fauss, Rudolf; Findeisen, Kurt; Becker, Benedikt; and Homeyer, Bernhard, 4,562,185, Cl. 514-229.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Fujii, Etsuo; Satoh, Makoto; and Toyoda, Mitsuo, 4,561,701, Cl. 303-119.000.
Kishida, Eiji; and Asakura, Masahiko, 4,561,394, Cl. 123-179.00G.
Kondo, Makoto, 4,561,855, Cl. 464-47.000.
Miyatake, Satoshi; Abe, Mitsuo; Kume, Masao; Yonemura, Shigehiro; and Umino, Hiroshi, 4,561,216, Cl. 51-165.920.
Omori, Yoshitaka, 4,561,519, Cl. 180-227.000.
Takada, Minoru, 4,561,670, Cl. 280-281.00R.

Honda, Michitaka; and Takami, Osamu, to Kabushiki Kaisha Toshiba. X-Ray image pick-up device. 4,562,586, Cl. 378-108.000.

Honda, Takeo: *See*—
Yamamoto, Shinjiro; Yokoi, Shinji; Matsumoto, Keigo; Honda, Takeo; and Kobayashi, Takashi, 4,562,193, Cl. 514-358.000.

Honeywell Inc.: *See*—
Adams, John T.; and Kompelien, Arlon D., 4,562,522, Cl. 363-21.000.
Bonne, Ulrich, 4,561,263, Cl. 62-176.200.
Matthys, Robert J., 4,562,526, Cl. 363-61.000.
Moenkhaus, Patrick R., 4,561,288, Cl. 73-23.000.

Honeywell Information Systems Inc.: *See*—
Keeley, James W.; Ledoux, Robert V.; and Negi, Virendra S., 4,562,536, Cl. 364-200.000.

Honma, Kazuo: *See*—
Watanabe, Hiroshi; Izumi, Eiki; Aoyagi, Yukio; Honma, Kazuo; and Nakajima, Kichio, 4,561,249, Cl. 60-421.000.

Hoover, Richard B.; and Hildner, Ernest, to United States of America, National Aeronautics and Space Administration. Spectral slicing X-ray telescope with variable magnification. 4,562,583, Cl. 378-43.000.

Hoover, William E.: *See*—
Smitherman, Robert A.; Staats, Thomas A.; and Hoover, William E., 4,561,137, Cl. 5-12.00R.

Hope, Henry F.; and Hope, Stephen F. Automatic material splicer for photographic materials. 4,561,924, Cl. 156-361.000.

Hope, Stephen F.: *See*—
Hope, Henry F.; and Hope, Stephen F., 4,561,924, Cl. 156-361.000.

Hopkins, Lonnie: *See*—
Scrantom, Dehart G.; and Hopkins, Lonnie, 4,561,954, Cl. 204-192.00R.

Hopp, Rudolf; Finkelmeier, Horst; and Langner, Roland, to Haarmann & Reimer GmbH. Preparation of novel dibenzoylmethane derivative sunscreen agents. 4,562,067, Cl. 424-59.000.

Hori, Yoshikazu: *See*—
Sasaki, Shunroku; Tsukada, Kazuo; Kanzaki, Yoshiharu; and Hori, Yoshikazu, 4,562,437, Cl. 343-394.000.

Horiishi, Nanao: *See*—
Nagai, Norimichi; Horiishi, Nanao; Kiyama, Masao; and Takada, Toshio, 4,561,988, Cl. 252-62.590.

Horike, Masanori: *See*—
Jinnai, Koichiro; and Horike, Masanori, 4,562,442, Cl. 346-75.000.

Horikiri, Toshihiko: *See*—
Matsushima, Yoshiaki; Chiaki, Nobutaka; Kato, Kuniaki; and Horikiri, Toshihiko, 4,561,628, Cl. 251-30.010.

Horikoshi, Yukio: *See*—
Sakamaki, Hiroshi; Sugishita, Susumu; and Horikoshi, Yukio, 4,561,835, Cl. 418-173.000.

Horn, Alan S.; and Agoston, Sandor, to Nelson Research & Development. 2,4-Diaminopyridine as a pharmacologic agent. 4,562,196, Cl. 514-332.000.

Horton, Derek; and Priebe, Waldemar A., to Ohio State University Research Foundation, The. 3'-Amino-2' halo-anthracycline antibiotics. 4,562,177, Cl. 514-34.000.

Horton Manufacturing Co., Inc.: *See*—
Dayen, Leonid, 4,561,522, Cl. 188-71.600.

Hosel, Fritz, to Trutzschler GmbH & Co. KG. Electronic pressure responsive switch. 4,562,358, Cl. 307-118.000.

Hosogoe, Junichi; Suzuki, Motoyuki; and Ida, Yuichi, to Alps Electric Co., Ltd. X-Y Positions input device for display system. 4,562,314, Cl. 200-5.00R.

Hosokawa, Masao: *See*—
Yamaguchi, Motoo; Sone, Isamu; Hirasawa, Kunio; Yoshioka, Yoshio; Nishikawa, Akio; Suzuki, Hiroshi; Sato, Mikio; and Hosokawa, Masao, 4,562,322, Cl. 200-148.00G.

Hotta, Yoshio, to Canon Kabushiki Kaisha. Electro-optical device having homogeneous alignment layer hardened with cross-linking agents. 4,561,725, Cl. 350-341.000.

Hottori, Makoto; and Yamanaka, Shoji, to Daicel Chemical Industries, Ltd. Electrochromic material and lubricant. 4,562,056, Cl. 423-351.000.

Houdaille Industries, Inc.: *See*—
Tremain, David L.; Beach, Burt L.; and Rimington, David J., 4,561,305, Cl. 73-323.000.

Houghton, Alan N.: *See*—
Real, Francisco X.; Mattes, M. Jules; Houghton, Alan N.; Livingston, Philip O.; Lloyd, Kenneth O.; Oettgen, Herbert F.; and Old, Lloyd J., 4,562,160, Cl. 436-539.000.

Houminer, Yoram: *See*—
Edwards, William B., III; and Houminer, Yoram, 4,561,451, Cl. 131-278.000.

Houpt, Grover K.; and Kayros, Richard, to American Manufacturing Company, Inc. Two-way pawl-ratchet wheel assembly. 4,561,320, Cl. 74-128.000.

House Food Industrial Company, Limited: *See*—
Sakakibara, Sakuichi; Tokuda, Yoshiaki; Nagai, Tamio; Mikata, Yoshitaka; and Nishide, Kazuhiro, 4,561,509, Cl. 177-25.000.

Houser, Stan. Water purification system. 4,561,976, Cl. 210-290.000.

Hovan, Edward J., to United Technologies Corporation. Bearing compartment for a gas turbine engine. 4,561,246, Cl. 60-226.100.

Hovey, Dean A.; Grundstrom, Douglas R.; and Yurchenco, James R., to Trace Systems, Inc. Input device featuring both trackball and mouse capability. 4,562,347, Cl. 250-221.000.

Howell, Steven E.: *See*—
Goetz, Fred E.; Harris, Jim C.; and Howell, Steven E., 4,561,620, Cl. 248-371.000.

Hoxan Corporation: *See*—
Maeda, Yasuhiro; Yokoyama, Takashi; and Yagihashi, Shinichi, 4,561,486, Cl. 164-118.000.

Hoya Corporation: *See*—
Sagara, Hiroji, 4,562,162, Cl. 501-60.000.

Hoyt, Robert M.; Dziedzic, Edward; and Rinehart, William M., to A. B. Chance Company. Tower-foundation anchor interconnection. 4,561,231, Cl. 52-297.000.

Hrovat, Milan; Huschka, Hans; Rachor, Lothar; and Vollath, Dieter, to Nukem GmbH. Process for the production of ceramic fuel tablets. 4,562,017, Cl. 264-0.500.

Hu, Victor L.; Mauldin, Larry W.; and Lee, John J., to Minnesota Mining and Manufacturing Company. Auditory-evoked-action-potential-measuring system. 4,561,449, Cl. 128-746.000.

Huang, Chin: *See*—
Chen, John; Huang, Chin; Graves, Nancy D.; and Hicks, James E., 4,562,508, Cl. 361-91.000.

Huber, Hans; and Vollkommer, Norbert, to Dynamit Nobel AG. Thermosetting adhesive and sealing compounds. 4,562,225, Cl. 524-602.000.

Huber, Johann: *See*—
Goritz, Bernd; Huber, Johann; and Meinicke, Peter, 4,561,700, Cl. 303-36.000.

Huber, Paul G.: *See*—
Beatty, Robert M.; Huber, Paul G.; and Miller, Edward B., 4,562,550, Cl. 364-492.000.

Hubert, Jean-Marie; Bauer, Jean-Michel; and Abouchar, Raif, to Le Carbone-Lorraine of Tour Manhattan. Liquid distribution system for chemical engineering apparatuses. 4,561,461, Cl. 137-561.00A.

Hubweber, Gerhard: *See*—
Mullner, Paul; Enkner, Bernhard; and Hubweber, Gerhard, 4,561,883, Cl. 75-10.00R.

Hudson Oxygen Therapy Sales Company: *See*—
Rowland, Robert O., 4,561,287, Cl. 73-23.000.

Hug, Paul, to Storage Technology Partners. Integrated circuit package removal. 4,561,584, Cl. 228-19.000.

Hughes, John M.: *See*—
McDonough, Kevin C.; Laffitte, David S.; and Hughes, John M., 4,562,435, Cl. 340-798.000.

Hughes Tool Company: *See*—
Garrett, William R., 4,561,508, Cl. 175-347.000.

Hughes, Vincent L.: *See*—
Small, Augustus B.; Hughes, Vincent L.; and Benitez, Francisco M., 4,562,233, Cl. 526-76.000.

Hugler, Klaus, to J. Lorch Gesellschaft & Co. KG. Solenoid valve. 4,561,632. Cl. 251-129.150.

Hull, William L. Knee-pad device. 4,561,123, Cl. 2-23.000.

Humber, Leslie G.: *See*—
Asselin, Andre A.; Crosilla, Danilo A.; and Humber, Leslie G., 4,562,200, Cl. 514-415.000.

Humblet, Pierre A., to Codex Corporation. Data compression. 4,562,423, Cl. 340-347.0DD.

Humphrey Instruments, Inc.: *See*—
Humphrey, William E.; and Campbell, Charles, 4,561,738, Cl. 351-226.000.

Humphrey, William E.; and Campbell, Charles, to Humphrey Instruments, Inc. Field tester. 4,561,738, Cl. 351-226.000.

Humphreys, John K.; and Valentine, Joseph, to Chloride Group Public Limited Company. Electric storage batteries. 4,562,128, Cl. 429-178.000.

Hunter, James D.; and Smith, James J., to Xomed Inc. Microscope drape. 4,561,540, Cl. 206-305.000.

Hunting Oilfield Services (UK) Limited: *See*—
Lumsden, Norman; and Phillips, Brian K., 4,561,683, Cl. 285-381.000.

Hurdle, Edmund S.: *See*—
Neiditch, Oscar W.; Hurdle, Edmund S.; and Fox, Daniel J., 4,562,002, Cl. 252-8.750.

Hurst, Robert N., Jr.; and Plotnick, Michael A., to RCA Corporation. Video disc encoding and decoding system providing intra-infield track error correction. 4,562,487, Cl. 358-342.000.

Hurter, Rudolf: *See*—
Schwander, Hansrudolf; and Hurter, Rudolf, 4,562,249, Cl. 534-641.000.

Huschka, Hans: *See—*
Hrovat, Milan; Huschka, Hans; Rachor, Lothar; and Vollath, Dieter, 4,562,017, Cl. 264-0.500.
Vietzke, Horst; Schlich, Elmar; Luthardt, Gunther; and Huschka, Hans, 4,562,001, Cl. 252-633.000.

Hutschenruter, Elfriede: *See—*
Andra, Klaus; Hutschenruter, Elfriede; and Besier, Horst-Erich, 4,562,101, Cl. 428-36.000.

Huttinger, Manfred: *See—*
Buchschmid, Emil; Gademann, Lothar; Hirt, Adam; Huttinger, Manfred; Jahn, Hans P.; Orova, Josef; Schmid, Hans-Dieter; and Steffen, Horst-Gunter, 4,561,410, Cl. 123-599.000.

Hwang, Kyu S.; and Koestler, Dennis J., to Duo-Matic/Olsen Inc. High efficiency furnace. 4,561,421, Cl. 126-110.00R.

Hwang, Tsong-Ching. Foldable baby bed. 4,561,138, Cl. 5-102.000.

I.S.C. Chemicals Limited: *See—*
Tatlow, John C.; Plevey, Raymond G.; Wotton, David E. M.; and Sargent, Colin R., 4,562,183, Cl. 514-214.000.

Iba, Youichi: *See—*
Mihara, Shin-ichi; Imai, Toshihiro; Nakahashi, Ken-ichi; Iba, Youichi; Imaizumi, Masaki; and Taira, Akio, 4,562,344, Cl. 250-201.000.

Ichida, Toshio: *See—*
Mochizuki, Kazuo; Nakakoji, Hisatada; Ichida, Toshio; Irie, Toshio; Ogata, Hajime; and Yamaji, Kyoko, 4,561,943, Cl. 204-28.000.

Ichihashi, Masazumi: *See—*
Ohmae, Kenichi; Tateisi, Kazuma; Shinohara, Yoshitsugu; and Ichihashi, Masazumi, 4,562,341, Cl. 235-379.000.

Ichikawa, Masashi; Takahashi, Yasuo; and Saito, Tohru, to Nippon Steel Corporation. Container having an easy opening end with a tab affixed by ultrasonic welding. 4,561,561, Cl. 220-270.000.

Ichikoh Industries Limited: *See—*
Kumagai, Toji, 4,562,518, Cl. 362-249.000.

Ida, Masatoshi: *See—*
Aoki, Masahiro; Nakamura, Junichi; Ida, Masatoshi; Oinoue, Kenichi; and Hayashi, Asao, 4,562,345, Cl. 250-201.000.
Hayashi, Asao; Oinoue, Kenichi; Aoki, Masahiro; and Ida, Masatoshi, 4,562,346, Cl. 250-201.000.

Ida, Yuichi: *See—*
Hosogoe, Junichi; Suzuki, Motoyuki; and Ida, Yuichi, 4,562,314, Cl. 200-5.00R.

Idogaki, Takaharu; Hayashi, Ikuo; Kawai, Hisasi; Hattori, Kyo; and Sakurai, Kazuhiro, to Nippon Soken, Inc.; and Toyota Jidosha Kabushiki Kaisha. Solenoid valve. 4,561,629, Cl. 251-65.000.

Igarashi, Yuriko: *See—*
Okada, Yoshio; and Igarashi, Yuriko, 4,562,116, Cl. 428-402.210.

Igawa, Kazushige: *See—*
Arika, Junji; Miyazaki, Hiroshi; Igawa, Kazushige; and Itabashi, Keiji, 4,562,055, Cl. 423-329.000.

Ikeda, Tadasu: *See—*
Tokumori, Yutaka; Mokuda, Osamu; Ikeda, Tadasu; Takeda, Akira; Tominaga, Masato; and Mashiba, Hiroto, 4,562,071, Cl. 424-94.000.

Ikoma, Hidenobu: *See—*
Kikumoto, Ryoji; Tobe, Akihiro; Tonomura, Shinji; and Ikoma, Hidenobu, 4,562,211, Cl. 514-648.000.

Ilsbo Industrier AB: *See—*
Fredrixon, Benny, 4,561,262, Cl. 62-62.000.

Imai, Hirozo: *See—*
Hamabe, Takafumi; Imai, Hirozo; and Hara, Hikoyoshi, 4,561,326, Cl. 74-798.000.

Imai, Toshihiro: *See—*
Mihara, Shin-ichi; Imai, Toshihiro; Nakahashi, Ken-ichi; Iba, Youichi; Imaizumi, Masaki; and Taira, Akio, 4,562,344, Cl. 250-201.000.

Imaizumi, Masaki: *See—*
Mihara, Shin-ichi; Imai, Toshihiro; Nakahashi, Ken-ichi; Iba, Youichi; Imaizumi, Masaki; and Taira, Akio, 4,562,344, Cl. 250-201.000.

Imaki, Katsuhiro; Muryobayashi, Takashi; and Kawasaki, Akiyoshi, to Ono Pharmaceutical Co., Ltd. Prostaglandin analogue. 4,562,207, Cl. 514-573.000.

Imi-Tech Corporation: *See—*
Lee, Raymond; Ferro, Gregory A.; and Okey, David W., 4,562,112, Cl. 428-318.600.

Imperial Chemical Industries PLC: *See—*
Coombes, Norman A.; Wilkinson, Michael R.; and Bromley, Charles W. A., 4,562,226, Cl. 524-767.000.
Stageman, John F., 4,562,245, Cl. 528-361.000.

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Tokusima, Akira; and Inaba, Ritsuo, 4,562,373, Cl. 310-328.000.

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Nagamune, Teruyuki; Inoue, Ichiro; and Takematsu, Noburu, 4,561,779, Cl. 356-442.000.

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Inoue, Kiyoshi, 4,561,214, Cl. 51-165.00R.
Inoue, Kiyoshi, 4,562,019, Cl. 264-24.000.
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Terano, Minoru; Kimura, Kouhei; Murai, Atsushi; Inoue, Masuo; and Miyoshi, Katsuyoshi, 4,562,173, Cl. 502-127.000.

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Mouri, Hideto; and Inoue, Nobuhiro, 4,561,694, Cl. 297-379.000.

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Institut Dr. Friedrich Forster Prufgeratebau GmbH & Co KG: *See—*
Stumm, Wolfgang, 4,562,349, Cl. 250-234.000.

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Klass, Donald L.; and Landahl, Carl D., 4,561,864, Cl. 55-16.000.

Interface Control Systems, Inc.: *See—*
Barth, Merlyn; and Kosednar, Joseph, 4,562,490, Cl. 360-44.000.

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Arnold, Anthony F.; and Schmeckenbecher, Arnold F., 4,562,513, Cl. 361-409.000.
Booker, Scott E., 4,561,506, Cl. 173-39.000.
Chainer, Timothy J.; and Worthington, Thomas K., 4,562,592, Cl. 382-3.000.
Ellis, Joseph J., Jr.; and Emerson, Geoffrey A., 4,562,450, Cl. 340-771.000.
Evans, Vaughn R.; Harris, Richard H.; Thorpe, Allan C.; and Watts, John E., 4,561,790, Cl. 400-124.000.
Ferry, Michel F. M. S.; and Trehin, Jacques L., 4,562,525, Cl. 363-45.000.
Gaffney, John E., Jr., 4,562,305, Cl. 178-22.080.
Goetz, Fred E.; Harris, Jim C.; and Howell, Steven E., 4,561,620, Cl. 248-371.000.
Sachdev, Harbans S.; and Sachdev, Krishna G., 4,562,091, Cl. 427-41.000.

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Bednar, Gregory M.; and Fryer, George B., 4,562,594, Cl. 382-9.000.

International Computers Limited: *See—*
Ratcliffe, Michael J., 4,562,576, Cl. 371-21.000.
Vince, Nigel L., 4,562,539, Cl. 364-200.000.

International Jensen Incorporated: *See—*
Bauer, Martin W.; Thys, Carl J.; Fredriksen, Peter A.; Robin, David J.; and Schaar, Richard J., 4,562,595, Cl. 455-345.000.
Mischenko, Peter S.; and Buehl, George T., 4,561,142, Cl. 15-97.00R.

International Minerals & Chemical Corp.: *See—*
Dancy, William B.; and Meng, Hsi, 4,562,058, Cl. 423-551.000.

International Shoe Machine Corporation: *See—*
Becka, Michael M.; and Goodenough, William G., 4,561,139, Cl. 12-1.00R.

International Standard Electric Corporation: *See—*
Heeks, John S.; and Cooke, Roger E., 4,561,727, Cl. 350-351.000.
Rodel, Gerhard; and Wolfel, Werner, 4,562,523, Cl. 363-21.000.

International Telephone and Telegraph Corporation: *See—*
Goldman, Stuart O.; Lissakers, Erik A.; and Thomson, Matthew W. S., 4,562,572, Cl. 370-80.000.

Intlekofer, Michael J.: *See—*
Hilse, Gernot R. K.; Intlekofer, Michael J.; and Auth, David C., 4,561,807, Cl. 406-99.000.

Inuizawa, Yoshihiro: *See—*
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Inuzuka, Hiroshi: *See—*
Katoh, Yoshiaki; and Inuzuka, Hiroshi, 4,561,147, Cl. 16-380.000.

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Kato, Toshiyuki; Takahashi, Isao; Irie, Toshio; and Ogawa, Yozo, 4,561,910, Cl. 148-12.400.
Mochizuki, Kazuo; Nakakoji, Hisatada; Ichida, Toshio; Irie, Toshio; Ogata, Hajime; and Yamaji, Kyoko, 4,561,943, Cl. 204-28.000.

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Wiernicki, Michael V., 4,561,819, Cl. 414-331.000.

Irvin, Darrell B., to Tektronix, Inc. Method and apparatus for generating phase locked digital clock signals. 4,562,402, Cl. 328-63.000.

Isbister, Jenefir D.; and Doyle, Richard C., to Atlantic Research Corporation. Mutant microorganism and its use in removing organic sulfur compounds. 4,562,156, Cl. 435-253.000.

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Porat, Reuven; and Nessel, Eliezer, 4,561,809, Cl. 407-114.000.

Ishibashi, Michiyasu: *See—*
Kawabata, Masaru; Furukawa, Teruo; and Ishibashi, Michiyasu, 4,562,491, Cl. 360-51.000.

Ishibashi, Takao: *See—*
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Ishida, Masato: *See*—
Omaki, Takanobu; Nakamura, Akiyoshi; Ishida, Masato; and Matsushita, Shuzo, 4,561,748, Cl. 354-403.000.
Ishida, Naobumi: *See*—
Micetich, Ronald G.; Yamabe, Shigeru; Tanaka, Motoaki; Kajitani, Makoto; Yamazaki, Tomio; and Ishida, Naobumi, 4,562,073, Cl. 424-114.000.
Ishigami, Shinji: *See*—
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Ishihara, Masamichi: *See*—
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Ishii, Tamaki: *See*—
Takahashi, Yukoh; Terada, Yutaka; Yachigo, Shinichi; and Ishii, Tamaki, 4,562,281, Cl. 560-104.000.
Ishikawa, Wataru: *See*—
Hirabayashi, Shigeto; Masukawa, Toyoaki; and Ishikawa, Wataru, 4,562,143, Cl. 430-353.000.
Ishizaka, Sunao; and Maida, Osamu, to Nippon Kogaku K.K. Camera film feed control apparatus. 4,561,741, Cl. 354-21.000.
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Ohashi, Naohito; Nagata, Shoji; and Ishizumi, Kikuo, 4,562,263, Cl. 548-479.000.
Isoya, Yukinori: *See*—
Teramura, Mitsuyoshi; Takimoto, Masatami; Nakamura, Norihiko; Itoh, Takaaki; Katou, Takashi; and Isoya, Yukinori, 4,562,012, Cl. 261-44.00C.
Itabashi, Keiji: *See*—
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Itek Corporation: *See*—
Bradley, William C., 4,562,467, Cl. 358-135.000.
Ito, Chikara: *See*—
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Ito, Hiroaki: *See*—
Suhara, Manabu; Sajima, Yasuo; Ito, Hiroaki; and Arai, Kiyotaka, 4,561,946, Cl. 204-98.000.
Ito, Keizo: *See*—
Kawano, Tadaaki; Ito, Keizo; and Nishida, Takashi, 4,561,760, Cl. 355-3.00R.
Ito, Masatoshi: *See*—
Matsuda, Motonobu; and Ito, Masatoshi, 4,561,746, Cl. 354-400.000.
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Itoh, Kenji, to Victor Company of Japan, Ltd. Motor servo circuit for a magnetic recording and reproducing apparatus. 4,562,394, Cl. 318-608.000.
Itoh, Takaaki: *See*—
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Itou, Susumu; Abe, Kishirou; and Kunou, Morishi, to Tomy Kogyo Kabushiki Kaisha. Method of shaping and machining disc wheel and equipment therefor. 4,561,275, Cl. 72-70.000.
ITT Industries, Inc.: *See*—
Barnard, Richard H.; and Stock, Terence P., 4,561,310, Cl. 73-861.020.
Drake, Cyril F.; Jones, Gladys M.; and Jones, Ronald, 4,561,896, Cl. 106-14.120.
Itzinger, Hermann: *See*—
Wossner, Felix; Itzinger, Hermann; and Schopplein, Leopold, 4,561,164, Cl. 29-510.000.
IVAC Corporation: *See*—
Bradley, John, 4,561,830, Cl. 417-474.000.
Iwahashi, Haruo: *See*—
Tarumi, Noriyoshi; Iwahashi, Haruo; Matsunawa, Masahiko; and Tokunaga, Hiroshi, 4,562,447, Cl. 346-159.000.
Iwata, Hiroshi; Takebayashi, Masahiro; Sakazume, Akio; Uneyama, Yoshihisa; Sekigami, Kazuo; Tagawa, Shigetaro; and Sugiyama, Masahiko, to Hitachi, Ltd. Rotary compressor with tapered valve ports for lubricating pump. 4,561,829, Cl. 417-368.000.
Izumi, Eiki: *See*—
Aoyagi, Yukio; Izumi, Eiki; Yamaguchi, Takeshi; and Tanaka, Sotaro, 4,561,250, Cl. 60-430.000.
Watanabe, Hiroshi; Izumi, Eiki; Aoyagi, Yukio; Honma, Kazuo; and Nakajima, Kichio, 4,561,249, Cl. 60-421.000.
Izumisawa, Yoshiaki: *See*—
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Izumiyama, Yoshio: *See*—
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J. Lorch Gesellschaft & Co. KG: *See*—
Hugler, Klaus, 4,561,632, Cl. 251-129.150.
Jack, Thomas R.: *See*—
Thompson, Bradley G.; and Jack, Thomas R., 4,561,500, Cl. 166-246.000.
Jackman, William. Remote fire hydrant actuator. 4,561,459, Cl. 137-291.000.
Jackson, Graham. Cooling electrical apparatus. 4,561,955, Cl. 204-229.000.
Jackson, Robert V., to McCulloch Corporation. Current-sheet inductor network and pulse-forming systems. 4,561,707, Cl. 315-209.0CD.
Jacobsen, Dennis D.: *See*—
Jacobsen, Douglas C.; and Jacobsen, Dennis D., 4,561,782, Cl. 366-349.000.
Jacobsen, Douglas C.; and Jacobsen, Dennis D. Tamping and stirring rod for use with a food and beverage blender. 4,561,782, Cl. 366-349.000.
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Berenbaum, Alan D.; Jagannathan, Anand; Molinelli, John J.; and Pekarich, Steven P., 4,562,538, Cl. 364-200.000.
Jager, Gerhard; Fauss, Rudolf; Findeisen, Kurt; Becker, Benedikt; and Homeyer, Bernhard, to Bayer Aktiengesellschaft. Five-membered nitrogen-containing hetero-cyclic compounds and their use as pest-combating agents. 4,562,185, Cl. 514-229.000.
Jahn, Hans P.: *See*—
Buchschmid, Emil; Gademann, Lothar; Hirt, Adam; Huttinger, Manfred; Jahn, Hans P.; Orova, Josef; Schmid, Hans-Dieter; and Steffen, Horst-Gunter, 4,561,410, Cl. 123-599.000.
Jahnke, Horst; Moro, Brigitte; Scholz, Erich; and Siebke, Hans, to Robert Bosch GmbH. Fuel filter unit with water content indicator. 4,562,431, Cl. 340-604.000.
Janecek, Kenneth F., to Envirotech Corporation. Multiple primary roll. 4,561,978, Cl. 210-401.000.
Janoski, Edward J.; and Hollstein, Elmer J., to United States of America, Energy. Method for removing chlorine compounds from hydrocarbon mixtures. 4,561,969, Cl. 208-262.000.
Jansens & Dieperink B.V.: *See*—
Fons, Gerrit, 4,561,222, Cl. 52-197.000.
Janssens de Varebeke, Philippe M.: *See*—
Cavalier, Robert G.; Cordi, Alexis A.; Gillet, Claude L.; Janssens de Varebeke, Philippe M.; Niebes, Paul J.; Roba, Joseph L.; Van Dorsser, William R.; Lambelin, Georges E.; and Franz, Michel R., 4,562,205, Cl. 514-546.000.
Japan Exlan Company Limited: *See*—
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Kubo, Kiyoshi; and Ohshiro, Toshio, 4,561,440, Cl. 128-395.000.
Japan Steel Works, Ltd., The: *See*—
Motoo, Akihiko, 4,562,331, Cl. 219-121.0ED.
Japes, Manfred, to MAN Maschinenfabrik Augsburg-Nurnberg AG. Driving mirror for motor vehicles. 4,561,732, Cl. 350-584.000.
Jaussi, Francois A.; Mayer, Andreas; and Spinnler, Fritz W., to BBC Brown, Boveri & Company, Limited. Control equipment for a pressure wave supercharger. 4,561,407, Cl. 123-559.000.
Jautelat, Manfred: *See*—
Elbe, Hans-Ludwig; Jautelat, Manfred; Buchel, Karl H.; Brandes, Wilhelm; Hanssler, Gerd; and Reinecke, Paul, 4,562,198, Cl. 514-383.000.
JBA Company: *See*—
Smith, Charles L., 4,561,704, Cl. 312-222.000.
Jeannot, Michel; and Salvalai, Italo, to Ebauches Electroniques SA. Arrangement for electrolytic deposition of conductive material on integrated circuit substrates. 4,561,960, Cl. 204-297.00W.
Jeans, Edward L., to Cadbury Schweppes, PLC. Carbonator valve. 4,562,013, Cl. 261-50.00B.
Jelens, David P., to GRM Industries, Inc. Sliding window assembly for a vehicle. 4,561,224, Cl. 52-207.000.
Jenkins, Patrick A., to Borg-Warner Corporation. Motorized flow control valve. 4,561,408, Cl. 123-571.000.
Jennings, James K., Jr.: *See*—
Winter, Roger D.; and Jennings, James K., Jr., 4,561,526, Cl. 190-115.000.
Jennings, Thomas P., to Kidde Recreation Products, Inc. Compound bow with improved limb tip hanger. 4,561,413, Cl. 124-23.00R.
Jensen, Gary L. Music stand for guitar player. 4,561,339, Cl. 84-453.000.
Jester, Terry L., to Dana Corporation. Transmission and range box control. 4,561,325, Cl. 74-745.000.
Jette, Paul M., to Del West Engineering, Inc. Girdle assembly for stud mounted rocker arms. 4,561,392, Cl. 123-90.430.
Jewell, Daniel E. Float valve apparatus for soil percolation measurements. 4,561,290, Cl. 73-38.000.
JGC Corporation: *See*—
Watanabe, Keiichiro; Yamada, Tomiaki; Sazanami, Tsuneo; and Asahara, Eiko, 4,562,154, Cl. 435-162.000.
Jidosha Kiki Co., Ltd.: *See*—
Kumekawa, Kazuhisa; and Ando, Shinichi, 4,561,274, Cl. 72-54.000.
Jinnai, Koichiro; and Horike, Masanori, to Ricoh Company, Ltd. Ink-jet printing apparatus. 4,562,442, Cl. 346-75.000.
Jobst Institute, Inc.: *See*—
Mummert, Thomas A., 4,561,343, Cl. 91-37.000.
Johansson, Gustav A., to Danfoss A/S. Valve apparatus for evacuating and/or filling a refrigeration system. 4,561,264, Cl. 62-292.000.
John R. Nalbach Engineering Co., Inc.: *See*—
Nalbach, John C., 4,561,534, Cl. 198-400.000.
Johns Hopkins University, The: *See*—
Hogrefe, Arthur F.; and Radford, Wade E., 4,561,443, Cl. 128-419.0PG.
Johnson, Dennis E. J. Method and device for in-line mass dispersion transfer of a gas flow into a liquid flow. 4,562,014, Cl. 261-64.00R.
Johnson, Frank C.; and Newsam, Susan M., to Rolls-Royce Limited. Method of manufacturing articles from a composite material. 4,562,033, Cl. 264-510.000.
Johnson, Kalin S.; and Abobrooks, Daniel E., to Colt Industries Operating Corp. Method for manufacturing a throttle-controlled induction passage assembly. 4,561,158, Cl. 29-156.40R.

Johnson, Paul H., to TRW Inc. Method for forming roller retainers in a bearing cage. 4,561,157, Cl. 29-148.40A.
Johnson, Richard J.: *See—*
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Johnstone, Robert M.: *See—*
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Joint Stock Company "L'Oreal" The: *See—*
Gueret, Jean-Louis H., 4,561,456, Cl. 132-88.700.
Jolivet, Jean-Claude R.: *See—*
Clapp, Craig S. K.; Shilston, Norman L.; Jolivet, Jean-Claude R.; Devimeux, Daniel P.; and Riou, Armand, 4,562,466, Cl. 358-133.000.
Jones, Evan T. R.: *See—*
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Jones, Gladys M.: *See—*
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Jones, Robert R. Swing away tire carrier and hitch. 4,561,575, Cl. 224-42.210.
Jones, Roger D.: *See—*
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Jones, Ronald: *See—*
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Jones, Roydn; Dagostino, Thomas P.; and Navarro, Luis J., to Tektronix, Inc. Method for using a charge coupled device as a peak detector. 4,562,363, Cl. 307-351.000.
Jones, Stanley C., to Marathon Oil Company. Perforated end plug plate for testing core samples. 4,561,289, Cl. 73-38.000.
Joo, Han S., to University of Minnesota, Regents of the. Method and kit for diagnosis of pseudorabies. 4,562,147, Cl. 435-5.000.
Jordan, Harold A.: *See—*
Lowe, Greg E.; and Jordan, Harold A., 4,561,576, Cl. 224-209.000.
Jousson, Pierre-Jean: *See—*
Moret, Michel-Antoine; Cuenoud, Gerard; and Jousson, Pierre-Jean, 4,561,251, Cl. 60-537.000.
Jundt, Wolfgang; Schaal, Gunter; Schadlich, Fritz; Vogt, Hans-Joachim; and Wunsch, Steffen, to Robert Bosch GmbH. Automatic screwdriver or torquing tool control system. 4,562,389, Cl. 318-432.000.
Justice, David D.: *See—*
Miles, Ronald C.; and Justice, David D., 4,561,949, Cl. 204-147.000.
Justus, Edgar J., to Beloit Corporation. Extended nip press arrangement. 4,561,939, Cl. 162-360.100.
Kabelitz, Hans-Peter: *See—*
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Kabushiki Kaisha Gakushu Kenkyusha: *See—*
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Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo: *See—*
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Kabushiki Kaisha Ishida Koki-Seisakusho: *See—*
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Kabushiki Kaisha Kobe Seiko Sho: *See—*
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Kabushiki Kaisha Komatsu Seisakusho: *See—*
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Kabushiki Kaisha Kumahira Seisakusho: *See—*
Tanaka, Minoru, 4,561,269, Cl. 70-339.000.
Kabushiki Kaisha Meidensha: *See—*
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Kabushiki Kaisha Suwa Seikosha: *See—*
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Kabushiki Kaisha Toshiba: *See—*
Hashimoto, Masahiro; and Tani, Hideo, 4,561,863, Cl. 51-295.000.
Honda, Michitaka; and Takami, Osamu, 4,562,586, Cl. 378-108.000.
Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
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Kagan, Jonathan: *See—*
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Kageyama, Takashi: *See—*
Kishido, Takeshi; Yoshino, Tetsuya; Kageyama, Takashi; and Kato, Kazuo, 4,561,378, Cl. 118-62.000.
Kajima, Norio: *See—*
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Kajino, Jirou: *See—*
Saito, Fuminari; Kajino, Jirou; and Kanchiku, Hiroshi, 4,562,496, Cl. 360-85.000.
Kajitani, Makoto: *See—*
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Kaku, Shinkyo: *See—*
Rallapalli, Krishna; and Kaku, Shinkyo, 4,562,484, Cl. 358-261.000.
Kakumaru, Hajime; and Hayashi, Nobuyuki, to Hitachi Chemical Company, Ltd. Aqueous alkali developable photosensitive composition and photosensitive laminate. 4,562,142, Cl. 430-288.000.
Kallmes, Otto J., to M/K Plank Corporation. Forming roll apparatus. 4,561,938, Cl. 162-314.000.
Kamai, Kenichiro, to Nippondenso Co., Ltd. Engine throttle valve position detecting system. 4,561,295, Cl. 73-117.300.
Kambayashi, Yuusaku, to NEC Corporation. Frame synchronizing signal insertion system. 4,562,574, Cl. 370-100.000.
Kameda, Eiichi; and Tobe, Seiichi, to Nippon Mektron Ltd. Through-hole pin for laminated circuit substrates and method of insertion thereof. 4,562,301, Cl. 174-68.500.
Kameda, Osamu: *See—*
Hirasawa, Yukinori; and Kameda, Osamu, 4,562,478, Cl. 358-236.000.
Kaminaga, Hiromitsu, to Yoshida Kogyo K.K. Unit curtain wall. 4,561,228, Cl. 52-235.000.
Kamohara, Eiji; and Seino, Kazuyuki, to Tokyo Shibaura Denki Kabushiki Kaisha. Insulated shadow mask assembly for a picture tube. 4,562,377, Cl. 313-402.000.
Kamp, Anthony W., to Shell Oil Company. Method and means for transmitting data through a drill string in a borehole. 4,562,560, Cl. 367-83.000.
Kampman, Lester R., to Highway Equipment Company. End cleaner for flail type manure spreader. 4,561,594, Cl. 239-658.000.
Kanai, Hiroshi: *See—*
Ezaki, Joichiro; Kanai, Hiroshi; and Kitahara, Yoshimi, 4,562,502, Cl. 360-114.000.
Kanamaru, Toshiji: *See—*
Moriya, Mitsuro; Kanamaru, Toshiji; and Nakata, Yoshinobu, 4,562,562, Cl. 369-32.000.
Kanayama, Ryoji: *See—*
Uzaki, Nagato; Kawamura, Yasutaro; Kanayama, Ryoji; and Harada, Hisashi, 4,561,485, Cl. 164-201.000.
Kanchiku, Hiroshi: *See—*
Saito, Fuminari; Kajino, Jirou; and Kanchiku, Hiroshi, 4,562,496, Cl. 360-85.000.
Kanda, Yohichi: *See—*
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizu, Susumu; Watanabe, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,561,877, Cl. 71-90.000.
Kaneko, Toshio; Sakamoto, Koji; Kanno, Fuchio; and Yasuda, Wataru, to Ricoh Company, Ltd. Voltage-controlled developing device. 4,561,381, Cl. 118-652.000.
Kaneko, Yoshiaki: *See—*
Saito, Toshiyuki; Okubo, Naofumi; and Kaneko, Yoshiaki, 4,562,409, Cl. 330-286.000.
Kang, Jung W., to Firestone Tire & Rubber Company, The. Method of preparing high cis-1,4 diene polymers having good green strength and tack using a catalyst composition containing a carboxylated metal oxy aluminate component. 4,562,171, Cl. 502-117.000.
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Kankare, Jouko, to Fluilogic Systems Oy. Ion-selective electrode and procedure for manufacturing same. 4,561,962, Cl. 204-415.000.
Kanno, Fuchio: *See—*
Kaneko, Toshio; Sakamoto, Koji; Kanno, Fuchio; and Yasuda, Wataru, 4,561,381, Cl. 118-652.000.
Kanno, Hideo: *See—*
Tanikawa, Keiichi; Fujii, Masahiro; and Kanno, Hideo, 4,561,911, Cl. 148-18.000.
Kanno, Yoshiaki; and Nakazumi, Tadataka, to Mitsubishi Denki Kabushiki Kaisha; and Mazda Motor Corporation. Fuel injection system for an engine. 4,561,404, Cl. 123-492.000.
Kano, Fumio: *See—*
Maruhashi, Yoshitsugu; Kano, Fumio; Yamada, Muneki; and Hirata, Sadao, 4,562,118, Cl. 428-412.000.
Kansai Paint Co., Ltd.: *See—*
Watanabe, Keiichiro; Yamada, Tomiaki; Sazanami, Tsuneo; and Asahara, Eiko, 4,562,154, Cl. 435-162.000.
Kanzaki, Yoshiharu: *See—*
Sasaki, Shunroku; Tsukada, Kazuo; Kanzaki, Yoshiharu; and Hori, Yoshikazu, 4,562,437, Cl. 343-394.000.
Kaplan, Leonard: *See—*
Harrison, Arnold M.; and Kaplan, Leonard, 4,562,272, Cl. 549-352.000.
Karl Schmidt GmbH: *See—*
Mielke, Siegfried, 4,562,327, Cl. 219-76.110.
Kasuya, Katsuhiko: *See—*
Nakajima, Tadakatsu; Nakayama, Wataru; Daikoku, Takahiro; Kuwahara, Heikichi; Yasukawa, Akira; Kasuya, Katsuhiko; Yokoi, Kazuaki; Nakae, Hideo; and Yoshida, Hiromichi, 4,561,497, Cl. 165-133.000.

Kasyanov, Grigory I.: *See*—
Kudinov, Gennady A.; Kasyanov, Grigory I.; Lysenko, E ·geny E.; Tolochko, Alexei I.; Yazev, Vasily A.; and Antonov, Vladimir M., 4,561,639, Cl. 266-193.000.

Kataoka, Keiji; Saito, Susumu; Arimoto, Akira; Hashimoto, Akira; and Tatsuno, Kimio, to Hitachi, Ltd.; and Hitachi Koki Co, Ltd. Optical system for information processing. 4,561,717, Cl. 350-6.800.

Kato, Kazuo: *See*—
Kishido, Takeshi; Yoshino, Tetsuya; Kageyama, Takashi; and Kato, Kazuo, 4,561,378, Cl. 118-62.000.

Kato, Kuniaki: *See*—
Matsushima, Yoshiaki; Chiaki, Nobutaka; Kato, Kuniaki; and Horikiri, Toshihiko, 4,561,628, Cl. 251-30.010.

Kato, Masahiko: *See*—
Sakakibara, Kazuo; Shimogawa, Toshiaki; Kato, Masahiko; and Matsuoka, Fumio, 4,561,606, Cl. 242-107.000.

Kato, Shinichi: *See*—
Sato, Ken; Takahashi, Yutaka; Tsukaya, Takashi; Kato, Shinichi; and Hattori, Shinichiro, 4,561,429, Cl. 128-6.000.

Kato, Toshio: *See*—
Yanagisawa, Akira; Yazawa, Hisashi; and Kato, Toshio, 4,561,235, Cl. 53-411.000.

Kato, Toshiyuki; Takahashi, Isao; Irie, Toshio; and Ogawa, Yozo, to Kawasaki Steel Corporation. Dual phase-structured hot rolled high-tensile strength steel sheet and a method of producing the same. 4,561,910, Cl. 148-12.400.

Katoh, Katsunori: *See*—
Masuda, Kosaku; Miyagi, Kaoru; Katoh, Katsunori; Nakayama, Noritaka; Kimura, Toshihiko; and Kawakatsu, Satoshi, 4,562,146, Cl. 430-546.000.

Katoh, Yoshiaki; and Inuzuka, Hiroshi, to Miwa Lock Co. Ltd. Hinge which facilitates opening door after the gate frame is distorted. 4,561,147, Cl. 16-380.000.

Katou, Takashi: *See*—
Teramura, Mitsuyoshi; Takimoto, Masatami; Nakamura, Norihiko; Itoh, Takaaki; Katou, Takashi; and Isoya, Yukinori, 4,562,012, Cl. 261-44.00C.

Katsuki, Kosuke: *See*—
Arita, Yosihumi; Katsuki, Kosuke; and Tabuchi, Sadao, 4,561,601, Cl. 242-35.50R.

Katsuno, Ryuji; and Tsuda, Toshihiko, to Fuji Xerox Co., Ltd. Thermal fixing roll for electrographic processing. 4,562,335, Cl. 219-216.000.

Katsuo, Kenichi: *See*—
Yamane, Noriomi; Arimatsu, Yoshikazu; Katsuo, Kenichi; Saitoh, Minoru; Tani, Katsya; Mitamura, Hideyuki; and Hiroyoshi, Kamatani, 4,562,239, Cl. 528-65.000.

Katsura, Yousuke: *See*—
Ueda, Ikuo; Taniguchi, Kiyoshi; and Katsura, Yousuke, 4,562,190, Cl. 514-254.000.

Kautt & Bux KG: *See*—
Gerlach, Heinz; and Worner, Lothar, 4,562,369, Cl. 310-235.000.

Kawabata, Masaru; Furukawa, Teruo; and Ishibashi, Michiyasu, to Mitsubishi Denki Kabushiki Kaisha. Multichannel digital magnetic recording apparatus. 4,562,491, Cl. 360-51.000.

Kawai, Hisasi: *See*—
Idogaki, Takaharu; Hayashi, Ikuo; Kawai, Hisasi; Hattori, Kyo; and Sakurai, Kazuhiro, 4,561,629, Cl. 251-65.000.

Kawai, Osamu, to NSK-Warner K. K. Passive seat belt device. 4,561,677, Cl. 280-804.000.

Kawai, Taneichi; and Masuda, Mituyoshi, to Aisin Seiki Kabushiki Kaisha. Safety device for electromechanical opening and closing mechanism. 4,561,691, Cl. 296-216.000.

Kawakami, Hiroshi: *See*—
Morinaga, Kaoru; Kawakami, Hiroshi; and Kotoda, Yoshihiro, 4,562,497, Cl. 360-96.300.

Kawakatsu, Satoshi: *See*—
Masuda, Kosaku; Miyagi, Kaoru; Katoh, Katsunori; Nakayama, Noritaka; Kimura, Toshihiko; and Kawakatsu, Satoshi, 4,562,146, Cl. 430-546.000.

Kawamura, Norio; Yokoe, Hifumi; and Tsuda, Hideichi, to Nippon, Colin Co., Ltd. Apparatus and method of detecting arterial pulse wave. 4,561,447, Cl. 128-687.000.

Kawamura, Yasutaro: *See*—
Uzaki, Nagato; Kawamura, Yasutaro; Kanayama, Ryoji; and Harada, Hisashi, 4,561,485, Cl. 164-201.000.

Kawano, Tadaaki; and Nishida, Takashi, to Sharp Kabushiki Kaisha. Cleaning device for cleaning copy paper separation device and transport device in electrophotographic copying machine. 4,561,755, Cl. 355-3.0SH.

Kawano, Tadaaki; Ito, Keizo; and Nishida, Takashi, to Sharp Kabushiki Kaisha. Cleaning device for cleaning copy paper separation device in electrophotographic copying machine. 4,561,760, Cl. 355-3.00R.

Kawasaki, Akiyoshi: *See*—
Imaki, Katsuhiro; Muryobayashi, Takashi; and Kawasaki, Akiyoshi, 4,562,207, Cl. 514-573.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Tamba, Shinichi; and Fukui, Noboru, 4,561,386, Cl. 123-41.700.

Kawasaki, Kanjirou: *See*—
Watanabe, Hideo; Hakiri, Minoru; Kawasaki, Kanjirou; Kubo, Keishi; and Takigawa, Nobuhiro, 4,562,448, Cl. 346-208.000.

Kawasaki Kasei Chemicals Ltd.: *See*—
Sakai, Kazuaki; Sato, Tuneyasu; and Chiba, Kazuhiko, 4,561,935, Cl. 162-30.100.

Kawasaki Steel Corporation: *See*—
Kato, Toshiyuki; Takahashi, Isao; Irie, Toshio; and Ogawa, Yozo, 4,561,910, Cl. 148-12.400.

Mochizuki, Kazuo; Nakakoji, Hisatada; Ichida, Toshio; Irie, Toshio; Ogata, Hajime; and Yamaji, Kyoko, 4,561,943, Cl. 204-28.000.

Sunami, Hideo; Kuguminato, Hideo; Izumiyama, Yoshio; Yanagishima, Fumiya; Obara, Takashi; and Mochizuki, Kazuo, 4,561,909, Cl. 148-12.00D.

Takajo, Shigeaki, 4,561,893, Cl. 75-251.000.

Kawashima Textile Manufacturers Ltd.: *See*—
Yonehana, Kiyoshi; and Tachibana, Zenpei, 4,561,473, Cl. 139-21.000.

Kawasima, Yukio: *See*—
Onoda, Kenji; and Kawasima, Yukio, 4,561,195, Cl. 36-30.00R.

Kawasumi, Yoichi, to Mitsubishi Denki Kabushiki Kaisha. Method of winding a superconducting coil. 4,561,175, Cl. 29-605.000.

Kawauchi, Kazunori; and Sato, Junichi, to Daido Kogyo, Co., Ltd. Tire rim structure and method of manufacture. 4,561,481, Cl. 152-379.300.

Kawauchi, Masataka: *See*—
Matsuno, Jyunichi; Kawauchi, Masataka; and Yoshida, Masashi, 4,562,443, Cl. 346-76.0PH.

Kaya, Azmi: *See*—
Enterline, Larry L.; and Kaya, Azmi, 4,562,531, Cl. 364-164.000.

Kayaba Kogyo Kabushiki Kaisha: *See*—
Mizumukai, Ken; Masamura, Tatuya; and Yamanaka, Hiroshi, 4,561,524, Cl. 188-319.000.

Kayros, Richard: *See*—
Houpt, Grover K.; and Kayros, Richard, 4,561,320, Cl. 74-128.000.

Keefe, Arthur N. Saw gage. 4,561,186, Cl. 33-185.00R.

Keeley, James W.; Ledoux, Robert V.; and Negi, Virendra S., to Honeywell Information Systems Inc. Directory test error mode control apparatus. 4,562,536, Cl. 364-200.000.

Kehrer, Wolfgang, to Borsig GmbH. Heat exchanger for the cooling of gases, particularly from the synthesis of ammonia. 4,561,496, Cl. 165-103.000.

Keilmann, Fritz; and Kussmaul, Karl-Wilhelm, to Max-Planck-Gesellschaft zur Foerderung de Wissenschafen E.V. Attenuator for optical radiation. 4,561,721, Cl. 350-162.170.

Keller, Manfred; and Opladen, Gunter, to Kernforschungsanlage Julich GmbH. Apparatus for measuring beta-gamma radiation exposure. 4,562,354, Cl. 250-388.000.

Keller, Martin B., to Sandy Hill Corporation. Apparatus for trimming the edge of a web during formation using a drainage interrupting mask. 4,561,937, Cl. 162-286.000.

Keller, Roderich; and Nohmayer, Fritz, to Gesellschaft fur Schwerionenforschung mbH Darmstadt. High current ion source. 4,562,355, Cl. 250-423.00R.

Kelley, Richard L.; and Holbrow, Frederick W. Catamaran stabilization structure. 4,561,371, Cl. 114-61.000.

Kellner, Gerd: *See*—
Bertiller, Roland; Kellner, Gerd; and Peter, Bernhard, 4,561,340, Cl. 89-127.000.

Kelly, Thomas A. Web accumulator with arcuate guide supports. 4,561,581, Cl. 226-113.000.

Kenan, Richard P.; and Verber, Carl M., to Battelle Memorial Institute. Electrooptical comparators. 4,561,728, Cl. 350-356.000.

Kennecott Corporation: *See*—
Carpenter, James H.; Mullins, Ronald L.; and Smith, Ronald L., 4,561,220, Cl. 51-427.000.

Kenney, George C., II: *See*—
Frankfort, Eric J.; Kenney, George C., II; and McFarlane, Robert, 4,562,567, Cl. 369-106.000.

Kentaro, Inoue: *See*—
Tadanobu, Yamazawa; and Kentaro, Inoue, 4,562,378, Cl. 313-499.000.

Keoshkerian, Barkev: *See*—
Ong, Beng S.; Keoshkerian, Barkev; Murti, Dasarao K.; and Mammino, Joseph, 4,562,132, Cl. 430-59.000.

Keppel, Robert A.: *See*—
Wrobleski, James T.; Edwards, James W.; Graham, Charles R.; Keppel, Robert A.; and Raffelson, Harold, 4,562,268, Cl. 549-259.000.

Kernforschungsanlage Julich GmbH: *See*—
Keller, Manfred; and Opladen, Gunter, 4,562,354, Cl. 250-388.000.
Mallek, Heinz, 4,561,363, Cl. 110-229.000.
Ringel, Helmut, 4,562,000, Cl. 252-630.000.

Kerr-McGee Chemical Corporation: *See*—
Moles, Oliver W.; Ensley, Kenneth L.; and Perkins, Haywood A., 4,562,048, Cl. 423-81.000.

Kerscher, Max; and Kroning, Armin, to Siemens Aktiengesellschaft. Converter. 4,562,383, Cl. 315-225.000.

Kessler Products Co., Inc.: *See*—
Ullman, Myron E., Jr., 4,561,212, Cl. 49-503.000.

Kessler, Theodore P. Float and depth gauge. 4,561,205, Cl. 43-4.500.

Key Pharmaceuticals, Inc.: *See*—
Tuttle, Ronald R., 4,562,206, Cl. 514-548.000.

Keyes, Marion A., IV; and Thompson, William L., to Babcock & Wilcox Company, The. Bridge excitation for sensor used on a vortex shedding flow meter. 4,561,311, Cl. 73-861.220.

Kidd, John C.: *See*—
Gladden, Robert S., Jr.; Johnson, Richard J.; Kidd, John C.; and Younkin, Robert A., 4,561,232, Cl. 52-385.000.

Kidde, Inc.: *See*—
Sterner, Russell L., 4,561,552, Cl. 212-261.000.

Kidde Recreation Products, Inc.: *See*—
Jennings, Thomas P., 4,561,413, Cl. 124-23.00R.

Kiehs, Karl: *See*—
Theobald, Hans; Adolphi, Heinrich; and Kiehs, Karl, 4,562,259, Cl. 548-112.000.

Kikukawa, Shozo; and Yasufuku, Yoshitaka, to Konishiroku Photo Industry Co., Ltd. Magnetic recording medium and a process of fabricating such magnetic recording medium. 4,562,117, Cl. 428-407.000.

Kikumoto, Ryoji; Tobe, Akihiro; Tonomura, Shinji; and Ikoma, Hidenobu, to Mitsubishi Chemical Industries, Ltd. Pharmaceutically active 2-substituted-1-(omega-aminoalkoxy)benzenes. 4,562,211, Cl. 514-648.000.

Killi, Geza: *See*—
Bonitz, Jorg; Entenmann, Robert; Killi, Geza; Knab, Rochus; Miller, Bernhard; Rohde, Siegfried; and Viess, Walter, 4,562,544, Cl. 364-431.110.

Kimble, James B.: *See*—
Bresson, Clarence R.; Parlman, Robert M.; and Kimble, James B., 4,561,984, Cl. 252-61.000.

Kimble, Kenneth B.; and Bresson, Clarence R., to Phillips Petroleum Company. Ore flotation and flotation agents for use therein. 4,561,971, Cl. 209-166.000.

Kimura, Fumihiko: *See*—
Yamamoto, Hisao; Kimura, Fumihiko; and Ogiso, Osamu, 4,561,987, Cl. 252-8.900.

Kimura, Hiroyuki: *See*—
Tanaka, Hiromichi; Kimura, Hiroyuki; Noda, Tsutomu; Arai, Takao; Kobayashi, Masaharu; and Inoue, Shigeki, 4,562,549, Cl. 364-486.000.

Kimura, Kouhei: *See*—
Terano, Minoru; Kimura, Kouhei; Murai, Atsushi; Inoue, Masuo; and Miyoshi, Katsuyoshi, 4,562,173, Cl. 502-127.000.

Kimura, Toshihiko: *See*—
Masuda, Kosaku; Miyagi, Kaoru; Katoh, Katsunori; Nakayama, Noritaka; Kimura, Toshihiko; and Kawakatsu, Satoshi, 4,562,146, Cl. 430-546.000.

Kimura, Tutomu; Tsuge, Takeyoshi; Torisawa, Yoshihiro; and Makino, Ayumu, to Tokyo Electric Co. Ltd. Ink-dot printer with magnetic ink attracting and retention preventing means. 4,562,446, Cl. 346-140.00R.

King, Stephen W., to Microlife Technics, Inc. Method for converting malic acid to lactic acid in wine. 4,562,077, Cl. 426-13.000.

King, William F., to Chevron Research Company. Pesticidal O-(N-alkoxy-substituted-ortho-fluoro-benzimidoyl)-thiophosphonates. 4,562,180, Cl. 514-114.000.

Kingsley, Michael L.: *See*—
Snellman, Donald L.; Kingsley, Michael L.; and Pearson, Bernard A., 4,561,647, Cl. 271-296.000.

Kinoshita, Kenji: *See*—
Niimi, Kiwamu; and Kinoshita, Kenji, 4,561,152, Cl. 19-244.000.

Kinsman, Gordon F.; Lambert, Ronald F.; and Morrison, David A., to Polaroid Corporation. Method and apparatus for processing both sides of discrete sheets. 4,561,745, Cl. 354-299.000.

Kirchner, Hansjorg, to Kirchner & Wilhelm. Tensioning device, particularly for tightening bands in medical practice. 4,561,437, Cl. 128-327.000.

Kirchner & Wilhelm: *See*—
Kirchner, Hansjorg, 4,561,437, Cl. 128-327.000.

Kirchoff, George F.: *See*—
Adams, Gary V.; Ahlf, Wilbur J.; Kirchoff, George F.; and Lange, Rholand E., 4,561,675, Cl. 280-734.000.

Kishida, Eiji; and Asakura, Masahiko, to Honda Giken Kogyo Kabushiki Kaisha. Air intake side secondary air supply system for an internal combustion engine. 4,561,394, Cl. 123-179.00G.

Kishida, Kazuo; Sasaki, Isao; and Mori, Hiroshi, to Mitsubishi Rayon Co., Ltd. Flame retardant polyester resin compositions. 4,562,216, Cl. 523-433.000.

Kishido, Takeshi; Yoshino, Tetsuya; Kageyama, Takashi; and Kato, Kazuo, to Konishiroku Photo Industry Co., Ltd. Coating apparatus. 4,561,378, Cl. 118-62.000.

Kishore, Ganesh M., to Monsanto Company. Stabilization of L-phenylalanine ammonia-lyase enzyme. 4,562,151, Cl. 435-108.000.

Kisslig, Heinz. Sheet metal working device. 4,561,284, Cl. 72-464.000.

Kita, Yuzo: *See*—
Takagi, Katsuaki; Kita, Yuzo; Hagiwara, Yoshimune; Torii, Shuichi; and Ogawa, Kazuyoshi, 4,562,424, Cl. 340-347.0NT.

Kitabayashi, Yukio; Takahashi, Noriyoshi; Okuyama, Toshiaki; Watanabe, Masatoshi; and Ohura, Hitoshi, to Hitachi, Ltd. Squirrel-cage induction motor. 4,562,397, Cl. 318-814.000.

Kitagawa Industries Co., Ltd.: *See*—
Matsui, Kazuhiro, 4,561,153, Cl. 24-16.0PB.

Kitahara, Yoshimi: *See*—
Ezaki, Joichiro; Kanai, Hiroshi; and Kitahara, Yoshimi, 4,562,502, Cl. 360-114.000.

Kitano, Kyozo: *See*—
Sekiguchi, Shizuo; Kitano, Kyozo; and Nagano, Katsumasa, 4,561,999, Cl. 252-557.000.

Kittle, Paul A., to Kittle, Paul A. Method for suppressing coal dust. 4,561,905, Cl. 134-25.100.

Kiyama, Masao: *See*—
Nagai, Norimichi; Horiishi, Nanao; Kiyama, Masao; and Takada, Toshio, 4,561,988, Cl. 252-62.590.

Kizawa, Rikiichi; and Ishigami, Shinji, to Nisshin Flour Milling Co., Ltd. Process of manufacturing barm for bakery and pastry products. 4,562,078, Cl. 426-52.000.

Klamt, Manfred, to Siemens Aktiengesellschaft. Autoconverter with improved charging switch system. 4,562,527, Cl. 363-89.000.

Klass, Donald L.; and Landahl, Carl D., to Institute of Gas Technology. Gas sweetening by membrane permeation. 4,561,864, Cl. 55-16.000.

Kleemann, Axel; Martens, Jurgen; and Weigel, Horst, to Degussa Aktiengesellschaft. Process for obtaining pure L-leucine. 4,562,152, Cl. 435-116.000.

Kleemann, Axel; Martens, Jurgen; and Weigel, Horst, to Degussa Aktiengesellschaft. Process for the separation of L-leucine and L-isoleucine. 4,562,153, Cl. 435-116.000.

Kleinhuber, Harald. Apparatus for measuring the dimensions of cylindrical objects by means of a scanning laser beam. 4,561,778, Cl. 356-387.000.

Kley, Victor B. Electronic illumination control. 4,561,731, Cl. 350-510.000.

Klieber, Josef: *See*—
Korkemeier, Hans; Martschik, Walter; and Klieber, Josef, 4,561,387, Cl. 123-41.310.

Klocke, Harald; and Thomsen, Uwe H., to H. Kuhnke GmbH KG. Electro-fluidic control device. 4,561,344, Cl. 91-358.00A.

Kloeckner Stahlforschung GmbH: *See*—
Fassbinder, Hans-Georg, 4,561,466, Cl. 137-614.210.

Klopfenstein, King L. Operator powered reciprocating drive system. 4,561,668, Cl. 280-226.00R.

Kmecak, Ronald A.: *See*—
Beck, H. Wayne; Carruthers, James D.; Cornelius, Edward B.; Kmecak, Ronald A.; Kovach, Stephen M.; and Hettinger, William P., Jr., 4,561,968, Cl. 208-120.000.

Knab, Rochus: *See*—
Bonitz, Jorg; Entenmann, Robert; Killi, Geza; Knab, Rochus; Miller, Bernhard; Rohde, Siegfried; and Viess, Walter, 4,562,544, Cl. 364-431.110.

Knapke, Gerhard: *See*—
Rietbrock, Peter; and Knapke, Gerhard, 4,561,744, Cl. 354-234.100.

Knipe, Richard H.: *See*—
Fletcher, Aaron N.; and Knipe, Richard H., 4,562,580, Cl. 372-69.000.

Knodel, Gunter, to Getrag Getriebe- und Zahnradfabrik GmbH. Torsional vibration reducing connection between an internal combustion engine and a transmission. 4,561,532, Cl. 192-106.100.

Knoll International, Inc.: *See*—
Brownlie, Alan; Crawford, Jeffrey D.; and Smith, Harold A., 4,561,693, Cl. 297-306.000.

Knorr-Bremse GmbH: *See*—
Goritz, Bernd; Huber, Johann; and Meinicke, Peter, 4,561,700, Cl. 303-36.000.

Knott, Joseph, to Siemens Aktiengesellschaft. Device for filling and filtering toner from storage container into a feed container for a photocopier. 4,561,759, Cl. 355-3.0DD.

Knox, Joseph D.: *See*—
Lawson, John A.; Kuehnle, Manfred R.; and Knox, Joseph D., 4,561,730, Cl. 350-432.000.

Kobayashi, Masaharu: *See*—
Tanaka, Hiromichi; Kimura, Hiroyuki; Noda, Tsutomu; Arai, Takao; Kobayashi, Masaharu; and Inoue, Shigeki, 4,562,549, Cl. 364-486.000.

Kobayashi, Nobuyuki; and Hattori, Takashi, to Toyota Jidosha Kabushiki Kaisha. Method of controlling air-fuel ratio. 4,561,399, Cl. 123-478.000.

Kobayashi, Shinichi: *See*—
Shimano, Shizuo; Kobayashi, Shinichi; Yanagi, Mikio; Yamada, Osamu; Shida, Atsuhiko; and Futatsuya, Fumio, 4,561,880, Cl. 71-92.000.

Kobayashi, Takashi: *See*—
Yamamoto, Shinjiro; Yokoi, Shinji; Matsumoto, Keigo; Honda, Takeo; and Kobayashi, Takashi, 4,562,193, Cl. 514-358.000.

Koboshi, Shigeharu: *See*—
Kurematsu, Masayuki; and Koboshi, Shigeharu, 4,562,144, Cl. 430-372.000.

Koch, Wolfgang: *See*—
Schwirtlich, Ingo; Woditsch, Peter; and Koch, Wolfgang, 4,561,930, Cl. 156-616.00R.

Koeda, Kikuo; and Ito, Chikara, to Yukamelamin Company, Limited. Process for producing boron nitride. 4,562,050, Cl. 423-290.000.

Koehler, Paul C., to Pall Corporation. Porous metal article and method of making. 4,562,039, Cl. 419-2.000.

Koehring Company: *See*—
Brownbill, George A.; and Olsen, James E., 4,561,463, Cl. 137-596.130.

Koestler, Dennis J.: *See*—
Hwang, Kyu S.; and Koestler, Dennis J., 4,561,421, Cl. 126-110.00R.

Koga, Kunio; Sasaki, Yukihiro; and Samejima, Mutsumi, to Daicel Chemical Industries, Ltd. Method of operating mixer-settler. 4,562,288, Cl. 562-608.000.

Koga, Toshio, to NEC Corporation. Adaptive predictive coding apparatus of television signal. 4,562,468, Cl. 358-136.000.

Kohashi, Takahiro: *See*—
Miyazaki, Masaru; Takahashi, Susumu; Kohashi, Takahiro; and Ueyanagi, Kiichi, 4,561,169, Cl. 29-571.000.

Kohler, Ingomar: *See*—
Struck, Carl-Heinz; Schumacher, Ralf; Kohler, Ingomar; and Leppert, Gerd-Ullrich, 4,561,843, Cl. 432-214.000.

Kohmoto, Kohtaro: *See*—
Dobashi, Yoshitomi; Asakura, Masahiko; and Kohmoto, Kohtaro, 4,562,379, Cl. 313-619.000.

Kohmura, Isao; Miura, Jun; and Kajima, Norio, to Mitsubishi Paper Mills, Ltd. Photosensitive material for use in diffusion transfer process with matting agents in underlayer. 4,562,140, Cl. 430-244.000.

Kohno, Tsuguo; Yoshida, Yoshitaro; Tenjinbayashi, Koji; and Okazaki, Yuichi, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Diamond turning method for high-precision metal mirror. 4,561,333, Cl. 82-1.00C.

Koike, Keiichi: *See*—
Yanadori, Michio; Miyamoto, Seigo; and Koike, Keiichi, 4,561,493, Cl. 165-10.000.

Koizumi, Hideaki, to Hitachi, Ltd. Light source for producing atomic spectral line. 4,562,376, Cl. 313-34.000.

Kojima, Yuichi: *See*—
Odaka, Kentaro; Sako, Yoichiro; Kojima, Yuichi; Nakano, Kenji; and Moriwaki, Hisayoshi, 4,562,578, Cl. 371-40.000.

Kollmorgen Technologies Corporation: *See*—
Fisher, Robert L., 4,562,399, Cl. 322-94.000.
Loyzim, Robert J.; and Blythe, Michael P., 4,562,393, Cl. 318-599.000.

Kolodziej, Ronald M. Liquid back support pad for inclined surfaces. 4,561,441, Cl. 128-403.000.

Kompelien, Arlon D.: *See*—
Adams, John T.; and Kompelien, Arlon D., 4,562,522, Cl. 363-21.000.

Kondo, Kiyohiro; Sugawara, Hiroshi; and Hasebe, Nobuyuki, to Shin-Etsu Chemical Co., Ltd. Room temperature curable silicone rubber composition. 4,562,238, Cl. 528-18.000.

Kondo, Makoto, to Honda Giken Kogyo Kabushiki Kaisha. Friction clutch. 4,561,855, Cl. 464-47.000.

Kongskilde Koncernselskab A/S: *See*—
Andersen, Helge H., 4,561,504, Cl. 172-142.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Hirabayashi, Shigeto; Masukawa, Toyoaki; and Ishikawa, Wataru, 4,562,143, Cl. 430-353.000.
Kikukawa, Shozo; and Yasufuku, Yoshitaka, 4,562,117, Cl. 428-407.000.
Kishido, Takeshi; Yoshino, Tetsuya; Kageyama, Takashi; and Kato, Kazuo, 4,561,378, Cl. 118-62.000.
Kurematsu, Masayuki; and Koboshi, Shigeharu, 4,562,144, Cl. 430-372.000.
Masuda, Kosaku; Miyagi, Kaoru; Katoh, Katsunori; Nakayama, Noritaka; Kimura, Toshihiko; and Kawakatsu, Satoshi, 4,562,146, Cl. 430-546.000.
Saito, Kaneo, 4,561,167, Cl. 29-564.600.
Sasaki, Osamu; Hirose, Naohiro; and Sawada, Kiyoshi, 4,562,131, Cl. 430-58.000.
Tarumi, Noriyoshi; Iwahashi, Haruo; Matsunawa, Masahiko; and Tokunaga, Hiroshi, 4,562,447, Cl. 346-159.000.
Uemura, Morito; and Onodera, Kaoru, 4,562,138, Cl. 430-219.000.
Yanagisawa, Akira; Yazawa, Hisashi; and Kato, Toshio, 4,561,235, Cl. 53-411.000.

Kono, Masami: *See*—
Sugioka, Yukio; and Kono, Masami, 4,561,510, Cl. 177-84.000.

Konomura, Yutaka, to Olympus Optical Company Ltd. Suction controller of endoscopes. 4,561,428, Cl. 128-4.000.

Kopel, Howard J. Sealed unit for hydraulic lifter. 4,561,393, Cl. 123-90.480.

Kopetzky, Horst; Nagler, Werner; and Ossler, Walter, to Siemens Aktiengesellschaft. Subscriber connection circuit comprising feed resistors which can be bridged in low-ohmic fashion and an indication circuit which effects different indications. 4,562,308, Cl. 179-18.0FA.

Kopl, Rupert: *See*—
Gobel, Herbert; and Kopl, Rupert, 4,562,585, Cl. 378-83.000.

Korczak, Alexander; and Levis, William W., Jr., to BASF Wyandotte Corporation. Alkylene oxide adducts of vicinal toluenediamine. 4,562,290, Cl. 564-399.000.

Korenyi, Donald. Combustion apparatus. 4,561,841, Cl. 431-265.000.

Korkemeier, Hans; Martschik, Walter; and Klieber, Josef, to Dr. Ing.h.c.F. Porsche Aktiengesellschaft. Liquid cooling system for a turbocharged internal combustion engine. 4,561,387, Cl. 123-41.310.

Kornrumpf, William P.; and Laughton, William J., to General Electric Company. Control apparatus and methods, heat transfer systems and apparatus and methods for controlling such systems and for sensing and indicating low fluid charge conditions therein. 4,561,261, Cl. 62-126.000.

Kornrumpf, William P.: *See*—
Alley, Robert P.; Harnden, John D., Jr.; and Kornrumpf, William P., 4,561,314, Cl. 73-862.690.

Kosednar, Joseph: *See*—
Barth, Merlyn; and Kosednar, Joseph, 4,562,490, Cl. 360-44.000.

Kotlarewsky, Paul, to Mitel Corporation. Battery maintenance apparatus. 4,562,398, Cl. 320-31.000.

Kotoda, Yoshihiro: *See*—
Morinaga, Kaoru; Kawakami, Hiroshi; and Kotoda, Yoshihiro, 4,562,497, Cl. 360-96.300.

Kovach, Stephen M.: *See*—
Beck, H. Wayne; Carruthers, James D.; Cornelius, Edward B.; Kmecak, Ronald A.; Kovach, Stephen M.; and Hettinger, William P., Jr., 4,561,968, Cl. 208-120.000.

Kowalik, Joseph W.; and Krueger, David J., to Littelfuse, Inc. Time delay fuse. 4,562,420, Cl. 337-165.000.

Koyama, Reikichi; and Usugi, Kikuo, to Clarion Co., Ltd. Device for reproduced sound pitch modification in a tape player. 4,562,488, Cl. 360-8.000.

Koyo Seiko Kabushiki Kaisha: *See*—
Nakamura, Norihiko; Baika, Toyokazu; Shibata, Yoshiaki; and Miki, Toshio, 4,561,390, Cl. 123-90.150.

Koziol, Walter, to Modern Home Products Corp. Adjustable burner assembly. 4,561,419, Cl. 126-41.00R.

Krajewski, John J.: *See*—
Zimmerman, John M.; Krajewski, John J.; and Noren, Gerry K., 4,562,235, Cl. 526-304.000.

Kramer, Johannes: *See*—
Hempel, Hans-Ulrich; Novotny, Rudolf; Staller, Siegfried; and Kramer, Johannes, 4,561,873, Cl. 65-27.000.

Kranich, Neil J., II, to ASEA Electric, Inc. High voltage linear tap changer. 4,562,316, Cl. 200-16.00D.

Kreamer, William C., to FMC Corporation. Method and apparatus for packaging articles such as fruit. 4,561,236, Cl. 53-509.000.

Kreischer, Cody B., to Recon/Optical, Inc. Panoramic unity vision system. 4,561,733, Cl. 350-618.000.

Kreitchman, Morton A.; and Arnold, Kurt, to Valcor Engineering Corporation. Valve for use in jet engine systems and the like. 4,561,468, Cl. 137-625.500.

Kretzschmar, Klaus: *See*—
Rogler, Wolfgang; Markert, Helmut; Kretzschmar, Klaus; and Piecha, Gerhard, 4,562,227, Cl. 524-786.000.

Kristensson, Kent B. G.: *See*—
Siwersson, Olle L.; Wall, Arne E.; and Kristensson, Kent B. G., 4,561,596, Cl. 239-687.000.

Kristinsson, Haukur: *See*—
Meyer, Willy; Topfl, Werner; Kristinsson, Haukur; and Eckhardt, Wolfgang, 4,562,210, Cl. 514-604.000.

Krolla, Hans-Georg: *See*—
Mennemann, Karl; Gliemeroth, Georg; Ross, Ludwig; Speit, Burkhard; Geiler, Volkmar; Krolla, Hans-Georg; and Meckel, Lothar, 4,562,161, Cl. 501-59.000.

Krongold, Martin A.: *See*—
Brodbeck, Howard D.; and Krongold, Martin A., 4,561,258, Cl. 62-49.000.

Kroning, Armin: *See*—
Kerscher, Max; and Kroning, Armin, 4,562,383, Cl. 315-225.000.

Krueger, David J.: *See*—
Kowalik, Joseph W.; and Krueger, David J., 4,562,420, Cl. 337-165.000.

Kruger, Kurt J.: *See*—
Loechner, John T.; Kruger, Kurt J.; Nottingham, John R.; and Golembek, Joe M., 4,561,416, Cl. 126-21.00A.

Kryger, Allen C., to Squirt & Company. Grapefruit juice and process for preparing same. 4,562,087, Cl. 426-599.000.

Kubo, Keishi: *See*—
Watanabe, Hideo; Hakiri, Minoru; Kawasaki, Kanjirou; Kubo, Keishi; and Takigawa, Nobuhiro, 4,562,448, Cl. 346-208.000.

Kubo, Kiyoshi; and Ohshiro, Toshio, to Matsushita Electric Industrial Co., Ltd.; and Japan Medical Laser Laboratory Co., Ltd. Apparatus for laser light medical treatment. 4,561,440, Cl. 128-395.000.

Kubota, Ltd.: *See*—
Aikawa, Norihiro, 4,561,341, Cl. 91-6.000.
Hiraishi, Hisashi; Nishihara, Hisakatsu; and Shiokawa, Hiroyuki, 4,561,890, Cl. 75-125.000.

Kudinov, Gennady A.; Kasyanov, Grigory I.; Lysenko, Evgeny E.; Tolochko, Alexei I.; Yazev, Vasily A.; and Antonov, Vladimir M., to Vnipicermetenergoochistka. Cooling plate for metallurgical furnaces. 4,561,639, Cl. 266-193.000.

Kudo, Hiroyuki; Watanabe, Atsumi; and Sasaki, Hiroshi, to Hitachi, Ltd. Protective relay. 4,562,507, Cl. 361-85.000.

Kuehnle, Manfred R.: *See*—
Lawson, John A.; Kuehnle, Manfred R.; and Knox, Joseph D., 4,561,730, Cl. 350-432.000.

Kuguminato, Hideo: *See*—
Sunami, Hideo; Kuguminato, Hideo; Izumiyama, Yoshio; Yanagishima, Fumiya; Obara, Takashi; and Mochizuki, Kazuo, 4,561,909, Cl. 148-12.00D.

Kuhla, Donald E.; Studt, William L.; Campbell, Henry F.; and Yelnosky, John, to William H. Rorer, Inc. Triazinones for treating irritable bowel syndrome. 4,562,188, Cl. 514-245.000.

Kuhle, Engelbert; Paulus, Wilfried; Genth, Hermann; Brandes, Wilhelm; and Reinecke, Paul, to Bayer Aktiengesellschaft. N-Sulphenylated ureas, microbicidal agents containing these compounds and their use. 4,562,208, Cl. 514-593.000.

Kumagai, Toji, to Ichikoh Industries Limited; and Yugen-Gaisha Shiba Seisakusho. Light assembly for use on vehicles. 4,562,518, Cl. 362-249.000.

Kumar, Prabhat; and Anand, Vidhu, to Cabot Corporation. Silicon-rich alloy coatings. 4,561,892, Cl. 75-251.000.

Kumatani, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Low inertia, speed variable induction motor. 4,562,367, Cl. 310-62.000.

Kumazawa, Satoru: *See*—
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizu, Susumu; Watanabe, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,561,877, Cl. 71-90.000.

Kume, Masao: *See*—
Miyatake, Satoshi; Abe, Mitsuo; Kume, Masao; Yonemura, Shigehiro; and Umino, Hiroshi, 4,561,216, Cl. 51-165.920.

Kumekawa, Kazuhisa; and Ando, Shinichi, to Jidosha Kiki Co., Ltd. Method of and apparatus for forging hollow blank member. 4,561,274, Cl. 72-54.000.

Kummer, Rudolf: *See*—
Schneider, Heinz-Walter; Kummer, Rudolf; and Zimmerling, Dieter, 4,561,942, Cl. 203-96.000.
Kumpe, Gerhardt: *See*—
Heimburger, Norbert; Kumpe, Gerhardt; Wormsbacher, Wilfried; and Preis, Hans M., 4,562,072, Cl. 424-101.000.
Kunou, Morishi: *See*—
Itou, Susumu; Abe, Kishirou; and Kunou, Morishi, 4,561,275, Cl. 72-70.000.
Kunsman, Donald R., to Victaulic Company of America. Pipe coupling. 4,561,678, Cl. 285-39.000.
Kurata, Shuhei: *See*—
Graham, Kenneth W.; Norton, Edward J.; and Kurata, Shuhei, 4,561,140, Cl. 12-146.0BR.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizu, Susumu; Watanabe, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,561,877, Cl. 71-90.000.
Okada, Yoshio; and Igarashi, Yuriko, 4,562,116, Cl. 428-402.210.
Kurematsu, Masayuki; and Koboshi, Shigeharu, to Konishiroku Photo Industry Co., Ltd. Image stabilizer for silver halide photographic material. 4,562,144, Cl. 430-372.000.
Kurihara, Tetsuro, to Tokyo Shibaura Denki Kabushiki Kaisha. X-Ray diagnostic apparatus. 4,562,464, Cl. 358-111.000.
Kurimoto Iron Works, Ltd.: *See*—
Sakaguchi, Keizo; and Takeuchi, Shigeru, 4,562,030, Cl. 264-173.000.
Kuriyama, Yasuhisa; Kajiwara, Syoichiro; and Ozaki, Fumikazu, to Mitsubishi Gas Chemical Company, Inc. Scale inhibitor. 4,561,982, Cl. 210-698.000.
Kurokawa, Hiroshi; Kurokawa, Sunji; and Saito, Yuichi, to Ricoh Company, Ltd. Transmission interruption signal detection system. 4,562,483, Cl. 358-257.000.
Kurokawa, Sunji: *See*—
Kurokawa, Hiroshi; Kurokawa, Sunji; and Saito, Yuichi, 4,562,483, Cl. 358-257.000.
Kurtzman, Gary A.: *See*—
Hansen, Kenneth A.; and Kurtzman, Gary A., 4,562,405, Cl. 330-51.000.
Kussmaul, Karl-Wilhelm: *See*—
Keilmann, Fritz; and Kussmaul, Karl-Wilhelm, 4,561,721, Cl. 350-162.170.
Kuwahara, Heikichi: *See*—
Nakajima, Tadakatsu; Nakayama, Wataru; Daikoku, Takahiro; Kuwahara, Heikichi; Yasukawa, Akira; Kasuya, Katsuhiko; Yokoi, Kazuaki; Nakae, Hideo; and Yoshida, Hiromichi, 4,561,497, Cl. 165-133.000.
Kvas, Peter J.; and Fera, Claudio. Sliding door. 4,561,210, Cl. 49-372.000.
Kwan, William C. T.; and Pidcock, Anthony, to Rolls-Royce Limited. Gas turbine engine combustion apparatus. 4,561,257, Cl. 60-737.000.
Kyocera Corporation: *See*—
Yonehana, Kiyoshi; and Tachibana, Zenpei, 4,561,473, Cl. 139-21.000.
Kyowa Chemical Industry Co., Ltd.: *See*—
Miyata, Shigeo, 4,562,295, Cl. 568-366.000.
Kysor Industrial Corporation: *See*—
Marotto, Robert A., 4,561,684, Cl. 292-150.000.
La Telemecanique Electrique: *See*—
Belbel, Elie; Blanchard, Christian; Haury, Andre ; and Lauraire, Michel, 4,562,323, Cl. 200-151.000.
Laas, Harald; Tavs, Peter; Hannebaum, Heinz; and Stroezel, Manfred, to BASF Aktiengesellschaft. Process for the preparation of a bis-salicylidene-alkylene-diaminocobaltous ion complex. 4,562,277, Cl. 556-34.000.
Laboratoire Suisse de recherches Horlogeres: *See*—
Sekler, Jorg; Zumsteg, Alphonse E.; and Hintermann, Hans Erich, 4,561,286, Cl. 73-23.000.
Labovitz, Jeffrey N.; and Fang, Lawrence, to Lafarge Coppee. Pollen suppressant comprising a pyridazolylamine. 4,561,881, Cl. 71-92.000.
Lack, Larry H., to Auer, Frank M.; Auer, C. J.; and Lindenmayer, Paul B. Low profile ratchet wrench. 4,561,329, Cl. 81-62.000.
La Conti, Anthony B.: *See*—
Coker, Thomas G.; and La Conti, Anthony B., 4,561,945, Cl. 204-98.000.
Lafarge Coppee: *See*—
Labovitz, Jeffrey N.; and Fang, Lawrence, 4,561,881, Cl. 71-92.000.
Laffitte, David S.: *See*—
McDonough, Kevin C.; Laffitte, David S.; and Hughes, John M., 4,562,435, Cl. 340-798.000.
LaFoy, Carl J., to Phillips Petroleum Company. Mercaptan extraction process. 4,562,300, Cl. 585-854.000.
Lagadec, Roger: *See*—
Gaskell, Philip S.; Lagadec, Roger; and McNally, Guy, 4,562,489, Cl. 360-39.000.
Lahres, Hans: *See*—
Furter, Gerhard; and Lahres, Hans, 4,561,736, Cl. 351-159.000.
Laimer, Freidrich, to Voest-Alpine Aktiengesellschaft. Installation with a refractorily lined metallurgical vessel. 4,561,638, Cl. 266-158.000.
Laine, Richard M.: *See*—
Wilson, Robert B., Jr.; and Laine, Richard M., 4,562,291, Cl. 564-463.000.
Laing, Karsten. Jet stream device. 4,561,133, Cl. 4-491.000.
Laliberte, Jacques; and Choiniere, Gabriel, to B & R Choiniere. Forage blower. 4,561,805, Cl. 406-71.000.
Lamansky, Daniel R. Nail removing hammer. 4,561,635, Cl. 254-26.00R.
Lambelin, Georges E.: *See*—
Cavalier, Robert G.; Cordi, Alexis A.; Gillet, Claude L.; Janssens de Varebeke, Philippe M.; Niebes, Paul J.; Roba, Joseph L.; Van Dorsser, William R.; Lambelin, Georges E.; and Franz, Michel R., 4,562,205, Cl. 514-546.000.
Lambert, Ronald F.: *See*—
Kinsman, Gordon F.; Lambert, Ronald F.; and Morrison, David A., 4,561,745, Cl. 354-299.000.
Landahl, Carl D.: *See*—
Klass, Donald L.; and Landahl, Carl D., 4,561,864, Cl. 55-16.000.
Lang, Joseph H., to Xerox Corporation. Short paper path copy sheet transport system. 4,561,756, Cl. 355-3.0SH.
Lange, Rholand E.: *See*—
Adams, Gary V.; Ahlf, Wilbur J.; Kirchoff, George F.; and Lange, Rholand E., 4,561,675, Cl. 280-734.000.
Langner, Roland: *See*—
Hopp, Rudolf; Finkelmeier, Horst; and Langner, Roland, 4,562,067, Cl. 424-59.000.
Langton, Allan R.: *See*—
Faulconer, Mark; and Langton, Allan R., 4,561,853, Cl. 441-106.000.
Larbot, Andre : *See*—
Alary, Jean-Andre ; Cot, Louis; Gugliermotte, Francis; Larbot, Andre ; and Guizard, Christian, 4,562,021, Cl. 264-43.000.
Latham, Winchester E. Continuous sweep for road planing and milling machines. 4,561,145, Cl. 15-340.000.
Lau, Kam-Yin: *See*—
Yariv, Amnon; Harder, Christoph; and Lau, Kam-Yin, 4,562,569, Cl. 369-122.000.
Laughton, William J.: *See*—
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Laupot, Richard, to Wythe Industries Inc. Lamp socket bracket system. 4,561,713, Cl. 339-74.00R.
Lauraire, Michel: *See*—
Belbel, Elie; Blanchard, Christian; Haury, Andre ; and Lauraire, Michel, 4,562,323, Cl. 200-151.000.
Lautzenheiser, Terry L., to Emerson Electric Co. Calibrated area source task light. 4,562,515, Cl. 362-33.000.
Lavigne, Eric: *See*—
Gold, Stanley; Newman, Robert; and Lavigne, Eric, 4,561,223, Cl. 52-202.000.
Lawrence, Gordon L.: *See*—
Bishop, David C.; and Lawrence, Gordon L., 4,561,439, Cl. 128-348.100.
Lawrence, Ivan R., to Spectrolab, Incorporated. Carrier system for photovoltaic cells. 4,561,541, Cl. 206-332.000.
Lawrence, William, to Eldon Industries, Inc. Solder pot. 4,562,337, Cl. 219-421.000.
Lawson, John A.; Kuehnle, Manfred R.; and Knox, Joseph D., to Coulter Systems Corporation. Synthetic resin lens system for imaging apparatus. 4,561,730, Cl. 350-432.000.
Le Carbone-Lorraine of Tour Manhattan: *See*—
Hubert, Jean-Marie; Bauer, Jean-Michel; and Abouchar, Raif, 4,561,461, Cl. 137-561.00A.
Le Bigot, Yves; Audoye, Paul; Delmas, Michel; and Gaset, Antoine, to Agrifurane, S.A. Process for preparing esters of furan by a transesterification reaction. 4,562,273, Cl. 549-473.000.
Lebsock, Robert A., to United States of America, Army. Rotary union for high pressure gas. 4,561,681, Cl. 285-276.000.
Le Creff, Michel; Guillou, Francoise; and Buhagiar, Francois, to Thomson-CSF Telephone. Telephone circuit controlled by a 2 wire - 4 wire transmission integrated circuit microprocessor with line current emergency supply. 4,562,309, Cl. 179-90.00R.
Lectron Products, Inc.: *See*—
Slavin, Michael; Martus, Charles R.; and Miller, Ellsworth S., 4,561,631, Cl. 251-129.200.
Leddet, Philippe, to Regie Nationale des Usines Renault. Six-axis head for correction of movements. 4,561,176, Cl. 29-709.000.
Lederrey, Marc, to Montes Rado S.A. Watchcase. 4,561,783, Cl. 368-309.000.
Ledoux, Robert V.: *See*—
Keeley, James W.; Ledoux, Robert V.; and Negi, Virendra S., 4,562,536, Cl. 364-200.000.
Lee, Cecil D. Ultrasonic method and apparatus for cleaning transmissions. 4,561,902, Cl. 134-1.000.
Lee, Clifford C., to Phillips Petroleum Company. Catalyst and olefin polymerization. 4,562,168, Cl. 502-107.000.
Lee, Jeffrey H.: *See*—
Wilkinson, Maxwell; Patten, Malcolm J.; and Lee, Jeffrey H., 4,561,267, Cl. 66-178.00A.
Lee, John J.: *See*—
Hu, Victor L.; Mauldin, Larry W.; and Lee, John J., 4,561,449, Cl. 128-746.000.
Lee, Raymond; Ferro, Gregory A.; and Okey, David W., to Imi-Tech Corporation. Polyimide foam and process for the preparation of same. 4,562,112, Cl. 428-318.600.
Lee, Shy-Fuh, to Zoecon Corporation. 3-Alkoxy-4-substituted-phenoxy-2,3-unsaturated acid esters and derivatives thereof and the use thereof for the control of weeds. 4,561,882, Cl. 71-94.000.
Lefevre, Marcel R., to Munters Corporation, The. Open mesh fill assembly. 4,562,015, Cl. 261-94.000.

Lehnhoff, Richard N., to General Motors Corporation. Vehicle power window control. 4,562,387, Cl. 318-285.000.

Lemmers, Eugene: *See—*
Hammer, Edward E.; and Lemmers, Eugene, 4,562,381, Cl. 315-99.000.

Lenhardt, Karl. Apparatus for applying an adhesive strip of plastic to a glass pane. 4,561,929, Cl. 156-522.000.

Lenhart, Ronald A., to Precision Metal Fabricators, Inc. Vertical single filer conveyor system. 4,561,806, Cl. 406-88.000.

Lenk, Erich: *See—*
Schippers, Heinz; Lenk, Erich; Schiminski, Herbert; and Turk, Herbert, 4,561,603, Cl. 242-43.00A.

Leo, A. Frank, to DeSoto, Inc. Post-formable radiation-curing coatings. 4,561,950, Cl. 522-91.000.

Leppert, Gerd-Ullrich: *See—*
Struck, Carl-Heinz; Schumacher, Ralf; Kohler, Ingomar; and Leppert, Gerd-Ullrich, 4,561,843, Cl. 432-214.000.

Leroy, Daniel: *See—*
Mallen-Herrero, Jose ; Leroy, Daniel; Zimmermann, Urs; and Charlat, Patrice, 4,561,831,.Cl. 418-28.000.

Les Produits Associes LPA SA: *See—*
Moret, Michel-Antoine; Cuenoud, Gerard; and Jousson, Pierre-Jean, 4,561,251, Cl. 60-537.000.

Leslie, Thomas M.: *See—*
Goodby, John W.; Leslie, Thomas M.; and Patel, Jayantilal S., 4,561,726, Cl. 350-341.000.

Leuthold, Dieter: *See—*
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Lever Brothers Company: *See—*
Neiditch, Oscar W.; Hurdle, Edmund S.; and Fox, Daniel J., 4,562,002, Cl. 252-8.750.
Rubin, Fred K.; Blarcom, David V.; and Fox, Daniel J., 4,561,994, Cl. 252-187.230.

Levine, Peter A., to RCA Corporation. Dark current sensing with a solid-state imager having a CCD line register output. 4,562,473, Cl. 358-213.000.

Levine, Peter A., to RCA Corporation. DC Restoration of synchronously detected CCD imager output signals. 4,562,475, Cl. 358-213.000.

Levis, William W., Jr.: *See—*
Korczak, Alexander; and Levis, William W., Jr., 4,562,290, Cl. 564-399.000.

Levoy, Barton M. Eyeglass frame hinge. 4,561,735, Cl. 351-153.000.

Lew, Hyok S.; and Stranahan, Michael. Air-vac toilet. 4,561,132, Cl. 4-420.000.

Lewicki, John, to California Biotechnology, Inc. Monoclonal antibodies against alveolar surfactant protein. 4,562,003, Cl. 260-112.00B.

Lewis, Jack R.: *See—*
Walter, Robert J.; Lewis, Jack R.; and Moss, Charles M., 4,562,332, Cl. 219-121.0EM.

Leybold-Heraeus: *See—*
Berges, Hanns-Peter; and Kabelitz, Hans-Peter, 4,561,837, Cl. 418-255.000.

Li, Hsin L.; and Oswald, Hendrikus J., to Allied Corporation. Producing foamed fibers. 4,562,022, Cl. 264-54.000.

Libbey-Owens-Ford Company: *See—*
Weaver, William R., 4,561,625, Cl. 249-85.000.

Liebisch, Wolfgang: *See—*
Wassermann, Manfred; and Liebisch, Wolfgang, 4,562,407, Cl. 330-129.000.

Liff, Walter H. Animal watering apparatus. 4,561,384, Cl. 119-73.000.

Lilja, Per, to Dynapac AB. Arrangement for journalling large eccentric forces. 4,561,319, Cl. 74-61.000.

Lin, Stephen Y., to Reed Lignin Inc. Reaction product of lignosulfonate and unsaturated fatty amine. 4,562,236, Cl. 527-400.000.

Linden, Karl H. Extensible drill. 4,561,812, Cl. 408-225.000.

Lindenmayer, Paul B.: *See—*
Lack, Larry H., 4,561,329, Cl. 81-62.000.

Linder, Donald L.; and Murphy, William R., to Motorola, Inc. Digital frequency modulation system and method. 4,562,414, Cl. 332-9.00R.

Lindgren, Bengt, to Termofrost Sweden AB. Safety switch. 4,562,509, Cl. 361-104.000.

Lindy, Lowell B.: *See—*
Gilpin, Jo Ann; and Lindy, Lowell B., 4,562,280, Cl. 560-103.000.

Lion Corporation: *See—*
Sekiguchi, Shizuo; Kitano, Kyozo; and Nagano, Katsumasa, 4,561,999, Cl. 252-557.000.

Liou, Mou T. Tool adapter. 4,561,507, Cl. 173-93.700.

Lippitt, David L.: *See—*
Espelage, Paul M.; and Lippitt, David L., 4,562,396, Cl. 318-809.000.

Lippok, Peter: *See—*
Hodes, Erich; Lippok, Peter; and Miotk, Bernd, 4,562,122, Cl. 428-644.000.

Lipton, Lenny, to Stereographics Corp. Stereoscopic television system with field storage for sequential display of right and left images. 4,562,463, Cl. 358-88.000.

Lissakers, Erik A.: *See—*
Goldman, Stuart O.; Lissakers, Erik A.; and Thomson, Matthew W. S., 4,562,572, Cl. 370-80.000.

L'Italien, Yvon J.: *See—*
Butler, Donald E.; and L'Italien, Yvon J., 4,562,195, Cl. 514-294.000.

Littelfuse, Inc.: *See—*
Kowalik, Joseph W.; and Krueger, David J., 4,562,420, Cl. 337-165.000.

Liu, Ping Y., to General Electric Company. Polycarbonate resin mixtures. 4,562,222, Cl. 524-505.000.

Livingston, John H.; and Yomtov, Barry M., to Cordis Corporation. Implantable cardiac pacer having dual frequency programming and bipolar/linipolar lead programmability. 4,561,444, Cl. 128-419.0PG.

Livingston, Philip O.: *See—*
Real, Francisco X.; Mattes, M. Jules; Houghton, Alan N.; Livingston, Philip O.; Lloyd, Kenneth O.; Oettgen, Herbert F.; and Old, Lloyd J., 4,562,160, Cl. 436-539.000.

Ljung, Bo H. G.; and Cohen, Hyman, to Singer Company, The. Pathlength controller for ring laser gyroscope. 4,561,780, Cl. 356-350.000.

Llinas, Antonio M. Dress. 4,561,125, Cl. 2-105.000.

Lloyd, Kenneth O.: *See—*
Real, Francisco X.; Mattes, M. Jules; Houghton, Alan N.; Livingston, Philip O.; Lloyd, Kenneth O.; Oettgen, Herbert F.; and Old, Lloyd J., 4,562,160, Cl. 436-539.000.

Lo, Peter Y. K.; Thayer, LeRoy E.; and Wright, Antony P., to Dow Corning Corporation. Heat-curable silicone compositions, use thereof and stabilizer therefor. 4,562,096, Cl. 427-208.800.

Lock Jaws, Inc.: *See—*
Ferraro, Thomas A., 4,561,663, Cl. 279-123.000.

Lockwood, Michael W. Combination spacer and lifting device for machinery incorporating a bucket. 4,561,199, Cl. 37-117.500.

Loechner, John T.; Kruger, Kurt J.; Nottingham, John R.; and Golembek, Joe M., to Associates Group Partners, The. Self-contained portable oven air circulator. 4,561,416, Cl. 126-21.00A.

Lombardi, Gerald T.: *See—*
Przepiora, Edward; and Lombardi, Gerald T., 4,561,542, Cl. 206-418.000.

Long, Harry F.: *See—*
Fornadel, J. Stephen; and Long, Harry F., 4,562,218, Cl. 524-15.000.

Long, John B.; and Ware, Robert R. Solar cooker. 4,561,425, Cl. 126-451.000.

Long, Stephen L.; and Cheung, Yin L., to Texaco Inc. Modified throttling calorimeter. 4,561,785, Cl. 374-42.000.

Lord Corporation: *See—*
Warnaka, Glenn E.; and Zalas, John M., 4,562,589, Cl. 381-71.000.

Lovick, John: *See—*
Woodward, Antony I.; Tyler, George; and Lovick, John, 4,562,145, Cl. 430-538.000.

Lowe Alpine Systems, Inc.: *See—*
Lowe, Greg E.; and Jordan, Harold A., 4,561,576, Cl. 224-209.000.

Lowe, Christopher R.; and Earley, Fergus G. P., to National Research Development Corporation. Diagnostic device incorporating a biochemical ligand. 4,562,157, Cl. 435-291.000.

Lowe, Greg E.; and Jordan, Harold A., to Lowe Alpine Systems, Inc. Video equipment bag. 4,561,576, Cl. 224-209.000.

Lowrance, Arlen J.; and Lowrance, Constance A. Fishing capsule. 4,561,206, Cl. 43-43.110.

Lowrance, Constance A.: *See—*
Lowrance, Arlen J.; and Lowrance, Constance A., 4,561,206, Cl. 43-43.110.

Loyzim, Robert J.; and Blythe, Michael P., to Kollmorgen Technologies Corporation. Modulation scheme for PWM-type amplifiers or motors. 4,562,393, Cl. 318-599.000.

Luca, William A.: *See—*
MacDonald, Robert D., Jr.; Luca, William A.; and Johnstone, Robert M., 4,561,203, Cl. 40-570.000.

Lucas Industries Limited: *See—*
Beaumont, Paul, 4,561,827, Cl. 417-223.000.

Luchtenberg, Helmut: *See—*
Hegasy, Ahmed; Rupp, Roland; Ramsch, Klaus-Dieter; and Luchtenberg, Helmut, 4,562,069, Cl. 424-80.000.

Luckit Pty. Limited: *See—*
Cashmere, Raymond A., 4,561,664, Cl. 280-18.000.

Lummus Crest Inc.: *See—*
Minkkinen, Ari A., 4,561,965, Cl. 208-11.0LE.

Lumsden, Norman; and Phillips, Brian K., to Hunting Oilfield Services (UK) Limited. Pipe connector with interengageable tubular pin and tubular box members. 4,561,683, Cl. 285-381.000.

Lundie, William R.: *See—*
Wolf, Lester C.; and Lundie, William R., 4,561,565, Cl. 222-28.000.

Luong, John C.; and Scherer, George W., to Corning Glass Works. Method for making glass or ceramic article. 4,561,872, Cl. 65-18.100.

Luthardt, Gunther: *See—*
Vietzke, Horst; Schlich, Elmar; Luthardt, Gunther; and Huschka, Hans, 4,562,001, Cl. 252-633.000.

Lyon, Christopher J. Liquid container having sliding closure means. 4,561,560, Cl. 220-278.000.

Lysenko, Evgeny E.: *See—*
Kudinov, Gennady A.; Kasyanov, Grigory I.; Lysenko, Evgeny E.; Tolochko, Alexei I.; Yazev, Vasily A.; and Antonov, Vladimir M., 4,561,639, Cl. 266-193.000.

Lysenko, Zenon; and Pews, R. Garth, to Dow Chemical Company, The. Halonitriles, their preparation and use to make halopyridines. 4,562,009, Cl. 260-465.600.

M. A. Ford Mfg. Co., Inc.: *See—*
Schneider, Lee A., 4,561,813, Cl. 408-230.000.

M/K Plank Corporation: *See—*
Kallmes, Otto J., 4,561,938, Cl. 162-314.000.

MacCarthy, Jean J.: *See—*
Staba, E. John; and MacCarthy, Jean J., 4,562,250, Cl. 536-6.000.

MacCready, Willis, to Michigan Seat Company. Seat with foam snap-on cover. 4,561,695, Cl. 297-452.000.

MacDonald, Robert D., Jr.; Luca, William A.; and Johnstone, Robert M., to Dual-Lite Manufacturing. Opaque sign plaque with dual reflector illumination. 4,561,203, Cl. 40-570.000.
Machell, Greville, to Milliken Research Corporation. Method for producing a di-acetal of sorbitol and an aromatic aldehyde. 4,562,265, Cl. 549-364.000.
Machida, Hazime; and Tanaka, Motoharu, to Ricoh Company, Ltd. Ferrimagnetic oxides and magneto-optical recording medium employing the same. 4,562,105, Cl. 428-161.000.
Machinefabriek G. J. Nijhuis P.V.: *See*—
Nijhuis, Johan W., 4,561,149, Cl. 17-45.000.
Macknight, Eileen E.: *See*—
Ingram, John D.; and Macknight, Eileen E., 4,562,556, Cl. 367-26.000.
Madderra, Jimmy M.: *See*—
Hoffmeister, Lawrence D.; Madderra, Jimmy M.; and Thompson, Richard J., 4,561,568, Cl. 222-130.000.
Maeda, Kunihiro; Usami, Katsuhisa; Takeda, Yukio; Ogihara, Satoru; and Asai, Osamu, to Hitachi, Ltd. Powdery silicon carbide composition for sintering. 4,561,891, Cl. 75-238.000.
Maeda, Takao, to Toyota Jidosha Kabushiki Kaisha. Adhesive bonding of scatter coated metal objects. 4,562,104, Cl. 428-148.000.
Maeda, Yasuhiro; Yokoyama, Takashi; and Yagihashi, Shinichi, to Hoxan Corporation. Method for fabricating polycrystalline silicon wafer. 4,561,486, Cl. 164-118.000.
Maeshima, Katsuyoshi, to Canon Kabushiki Kaisha. Copying apparatus. 4,562,485, Cl. 358-280.000.
Magnetics International, Inc.: *See*—
Zwiebel, Rudy P., 4,561,538, Cl. 198-816.000.
Maida, Osamu: *See*—
Ishizaka, Sunao; and Maida, Osamu, 4,561,741, Cl. 354-21.000.
Maki, Yoshihiro: *See*—
Oaku, Takaaki; Hokazono, Yasuzi; Shiota, Masahiko; and Maki, Yoshihiro, 4,561,889, Cl. 75-125.000.
Makino, Ayumu: *See*—
Kimura, Tutomu; Tsuge, Takeyoshi; Torisawa, Yoshihiro; and Makino, Ayumu, 4,562,446, Cl. 346-140.00R.
Makipirtti, Simo A. I.; and Setala, Pekka T., to Outokumpu Oy. Apparatus for removal of impurity components from sulphidic and metallized molten copper mattes. 4,561,884, Cl. 75-21.000.
Makita, Mitsuyasu: *See*—
Shinjo, Goro; Makita, Mitsuyasu; and Tsuda, Shigenori, 4,562,062, Cl. 424-45.000.
Malicoat, Lewis M., Trustee: *See*—
Minton, Thomas C., 4,562,329, Cl. 219-99.000.
Mallek, Heinz, to Kernforschungsanlage Julich GmbH. Method and chamber for combustion of effluent gases from the pyrolysis of combustible material. 4,561,363, Cl. 110-229.000.
Mallen-Herrero, Jose ; Leroy, Daniel; Zimmermann, Urs; and Charlat, Patrice, to Compagnie de Construction Mecanique Sulzer. Rotary hydraulic axially slidable vane device of variable capacity. 4,561,831, Cl. 418-28.000.
Malthouse, Martin D. Labelling machine. 4,561,928, Cl. 156-497.000.
Malvern Scale Company: *See*—
Stuart, James M., 4,561,511, Cl. 177-225.000.
Mammino, Joseph: *See*—
Ong, Beng S.; Keoshkerian, Barkev; Murti, Dasarao K.; and Mammino, Joseph, 4,562,132, Cl. 430-59.000.
MAN Maschinenfabrik Augsburg-Nurnberg AG: *See*—
Japes, Manfred, 4,561,732, Cl. 350-584.000.
Mangels, John A.; and Dickie, Ray A., to Ford Motor Company. Method of reducing the green density of a slip cast article. 4,562,041, Cl. 419-40.000.
Mangone, Pascuale, to Domingo Mangone. Battery cap with electrolyte level indicator. 4,562,127, Cl. 429-89.000.
Mannheimer, Jeffrey S.: *See*—
Ferreira, Lloyd A.; and Mannheimer, Jeffrey S., 4,561,851, Cl. 434-272.000.
Manthe, Karl-Heinz: *See*—
Preuss, Bernhard; and Manthe, Karl-Heinz, 4,562,419, Cl. 335-195.000.
Marais, Jacques, to Societe Anonyme dite, Fast Lunch. Machine for washing flat tableware. 4,561,144, Cl. 15-302.000.
Marathon Oil Company: *See*—
Jones, Stanley C., 4,561,289, Cl. 73-38.000.
Norton, Charles J.; Falk, David O.; and Hill, Alfred D., 4,561,502, Cl. 166-274.000.
Marconi Company Limited, The: *See*—
Rouse, David G.; and Wilkinson, Christopher F., 4,562,438, Cl. 343-17.10R.
Marelli Autronica S.p.A.: *See*—
Guagliumi, Renato; and Blazic, Oscar, 4,561,296, Cl. 73-118.000.
Marinko, Joseph A., Jr.: *See*—
Goff, Jerry K.; Marinko, Joseph A., Jr.; Venditto, Joseph G., Jr.; and Yost, Donald A., 4,562,386, Cl. 318-254.000.
Marino, Jean-Claude; Marquet, Andre ; and Wetzel, Philippe, to Electricite de France Service National. Instrumentation support ring for high-power rotary machine rotor and method for attaching same to rotor shaft. 4,561,306, Cl. 73-432.00R.
Marino, Jerry C.: *See*—
Robillard, David R.; Bullock, Robert J.; and Marino, Jerry C., 4,561,619, Cl. 248-285.000.
Mario, Roth; and Gunther, Termath, to Saint-Gobain Vitrage. Process for the production of glass panes having a glare protection filter and apparatus for carrying out the process. 4,562,093, Cl. 427-109.000.
Mark, Victor; and Hedges, Charles V., to General Electric Company. Branched polycarbonate from carboxy containing diphenol. 4,562,242, Cl. 528-193.000.
Markert, Helmut: *See*—
Rogler, Wolfgang; Markert, Helmut; Kretzschmar, Klaus; and Piecha, Gerhard, 4,562,227, Cl. 524-786.000.
Markle, Richard A.; and Melchior, Wayne R., to Eagle-Picher Industries, Inc. Heat curable solventless liquid prepolymer and novel monomer derived from hexylcarbitol for use therewith. 4,562,008, Cl. 260-465.400.
Maroney, William H., to Van Slooten, Marion, a part interest. Seedling grading machine. 4,561,546, Cl. 209-586.000.
Marotto, Robert A., to Kysor Industrial Corporation. Automatic deadbolt. 4,561,684, Cl. 292-150.000.
Marple, Julian, Jr.: *See*—
Bumgardner, Dewey; and Marple, Julian, Jr., 4,561,130, Cl. 4-253.000.
Marquer, Andre. Device for vibrating a deep frying pan. 4,561,346, Cl. 99-348.000.
Marquet, Andre : *See*—
Marino, Jean-Claude; Marquet, Andre ; and Wetzel, Philippe, 4,561,306, Cl. 73-432.00R.
Marras, Gaetano: *See*—
Barbagli, Rino O.; and Marras, Gaetano, 4,561,513, Cl. 180-6.480.
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, to Roussel Uclaf. 4-Methyl-3-formyl-pentanoic acid esters. 4,562,282, Cl. 560-184.000.
Martens, Alan; Hobbs, Milton M.; and Myers, Gerald A., to Westinghouse Electric Corp. Initial steam flow regulator for steam turbine start-up. 4,561,254, Cl. 60-660.000.
Martens, Jurgen: *See*—
Kleemann, Axel; Martens, Jurgen; and Weigel, Horst, 4,562,152, Cl. 435-116.000.
Kleemann, Axel; Martens, Jurgen; and Weigel, Horst, 4,562,153, Cl. 435-116.000.
Martin, Dale A.: *See*—
Shirts, Monte B.; Martin, Dale A.; and Petersen, Allan E., 4,562,049, Cl. 423-82.000.
Martin, Trevor I.: *See*—
Winnik, Francoise M.; and Martin, Trevor I., 4,562,135, Cl. 430-106.000.
Martschik, Walter: *See*—
Korkemeier, Hans; Martschik, Walter; and Klieber, Josef, 4,561,387, Cl. 123-41.310.
Martus, Charles R.: *See*—
Slavin, Michael; Martus, Charles R.; and Miller, Ellsworth S., 4,561,631, Cl. 251-129.200.
Maruhashi, Yoshitsugu; Kano, Fumio; Yamada, Muneki; and Hirata, Sadao, to Toyo Seikan Kaisha, Ltd. Films, sheets, laminates and molded articles having gas barrier properties. 4,562,118, Cl. 428-412.000.
Masamura, Tatuya: *See*—
Mizumukai, Ken; Masamura, Tatuya; and Yamanaka, Hiroshi, 4,561,524, Cl. 188-319.000.
Masclet, Jean, to Messier-Hispaono-Bugatti (S.A.). Wheel lever landing gear. 4,561,612, Cl. 244-104.00R.
Mashiba, Hiroto: *See*—
Tokumori, Yutaka; Mokuda, Osamu; Ikeda, Tadasu; Takeda, Akira; Tominaga, Masato; and Mashiba, Hiroto, 4,562,071, Cl. 424-94.000.
Massachusetts Institute of Technology: *See*—
Geis, Michael W.; and Smith, Henry I., 4,562,106, Cl. 428-195.000.
Masuda, Kosaku; Miyagi, Kaoru; Katoh, Katsunori; Nakayama, Noritaka; Kimura, Toshihiko; and Kawakatsu, Satoshi, to Konishiroku Photo Industry Co., Ltd. Silver halide color photographic material. 4,562,146, Cl. 430-546.000.
Masuda, Mituyoshi: *See*—
Kawai, Taneichi; and Masuda, Mituyoshi, 4,561,691, Cl. 296-216.000.
Masuda, Shunichi, to Canon Kabushiki Kaisha. Image forming apparatus. 4,561,765, Cl. 355-14.0SH.
Masukawa, Toyoaki: *See*—
Hirabayashi, Shigeto; Masukawa, Toyoaki; and Ishikawa, Wataru, 4,562,143, Cl. 430-353.000.
Masuno, Katsuyoshi, to Mitsubishi Denki Kabushiki Kaisha. Ignition system for internal combustion engine. 4,561,411, Cl. 123-615.000.
Matburn (Holdings) Limited: *See*—
Bishop, David C.; and Lawrence, Gordon L., 4,561,439, Cl. 128-348.100.
Matheny, William F., III; Bernard, Clay, II; and Angell, William M., to SPS Technologies, Inc. Carousel automatic storage and retrieval system. 4,561,820, Cl. 414-331.000.
Mathews, Herbert H.: *See*—
Tusinski, Joseph; Barnes, Brian R.; and Mathews, Herbert H., 4,561,213, Cl. 51-105.0LG.
Mathews, Lester: *See*—
Mathews, Lester R.; and Galvin, Jay, 4,561,134, Cl. 4-496.000.
Mathews, Lester R.; and Galvin, Jay, to Mathews, Lester; Water Circ-Patents, Inc.; and Warner, Lucien. Fitting assembly for vinyl lined pools. 4,561,134, Cl. 4-496.000.
Matier, William L.: *See*—
Stout, David M.; and Matier, William L., 4,562,201, Cl. 514-422.000.
Matrick, Howard, to Du Pont de Nemours, E. I., and Company. Pigment toners with improved transparency. 4,561,899, Cl. 106-193.00P.

Matsuda, Motonobu; and Ito, Masatoshi, to Minolta Camera Kabushiki Kaisha. Focus detection device and automatic focusing device for camera. 4,561,746, Cl. 354-400.000.

Matsui, Kazuhiro, to Kitagawa Industries Co., Ltd. Cable clamp. 4,561,153, Cl. 24-16.0PB.

Matsumoto, Ikuo: *See*—
Nakamura, Takeshi; Matsumoto, Ikuo; and Ando, Kenji, 4,562,372, Cl. 310-321.000.

Matsumoto, Kazumi: *See*—
Hamano, Nobuo; and Matsumoto, Kazumi, 4,561,723, Cl. 350-331.00R.

Matsumoto, Keigo: *See*—
Yamamoto, Shinjiro; Yokoi, Shinji; Matsumoto, Keigo; Honda, Takeo; and Kobayashi, Takashi, 4,562,193, Cl. 514-358.000.

Matsumoto, Tetsuro: *See*—
Ouchi, Yoshiaki; Ishihara, Masamichi; Matsumoto, Tetsuro; and Miyazawa, Kazuyuki, 4,562,555, Cl. 365-233.000.

Matsumoto, Tokuichi, to Mazda Motor Corporation. Engine operation control means for suppressing rough engine operations. 4,561,389, Cl. 123-425.000.

Matsumura, Masami: *See*—
Saita, Toshikazu; Hino, Toshiyuki; and Matsumura, Masami, 4,561,412, Cl. 123-617.000.

Matsumura, Susumu, to Canon Kabushiki Kaisha. In-focus state detection device. 4,561,750, Cl. 354-406.000.

Matsunawa, Masahiko: *See*—
Tarumi, Noriyoshi; Iwahashi, Haruo; Matsunawa, Masahiko; and Tokunaga, Hiroshi, 4,562,447, Cl. 346-159.000.

Matsuno, Jyunichi; Kawauchi, Masataka; and Yoshida, Masashi, to Hitachi, Ltd. Thermal transfer color recording apparatus and recording method. 4,562,443, Cl. 346-76.0PH.

Matsuno, Kiyotaka: *See*—
Tsukamoto, Keisuk; Nagase, Masaomi; and Matsuno, Kiyotaka, 4,561,397, Cl. 123-357.000.

Matsuo, Noritada: *See*—
Nishida, Sumio; Matsuo, Noritada; Tsushima, Kazunori; Hatakoshi, Makoto; and Hirano, Masachika, 4,562,213, Cl. 514-721.000.

Matsuoka, Fumio: *See*—
Sakakibara, Kazuo; Shimogawa, Toshiaki; Kato, Masahiko; and Matsuoka, Fumio, 4,561,606, Cl. 242-107.000.

Matsushima, Shiro, to Shimano Industrial Company Limited. Spinning reel. 4,561,604, Cl. 242-84.20R.

Matsushima, Yoshiaki; Chiaki, Nobutaka; Kato, Kuniaki; and Horikiri, Toshihiko, to Tokyo Keiki Company Limited. Electromagnetically operated hydraulic actuator. 4,561,628, Cl. 251-30.010.

Matsushita Electric Industrial Co., Ltd.: *See*—
Kubo, Kiyoshi; and Ohshiro, Toshio, 4,561,440, Cl. 128-395.000.
Moriya, Mitsuro; Kanamaru, Toshiji; and Nakata, Yoshinobu, 4,562,562, Cl. 369-32.000.
Nishino, Atsushi; Yoshida, Akihiko; and Tanahashi, Ichiroh, 4,562,511, Cl. 361-324.000.
Saito, Fuminari; Kajino, Jirou; and Kanchiku, Hiroshi, 4,562,496, Cl. 360-85.000.
Tokusima, Akira; and Inaba, Ritsuo, 4,562,373, Cl. 310-328.000.
Wada, Takahiro; Yamamoto, Ryoichi; and Yokotani, Fumiko, 4,561,989, Cl. 252-70.000.
Yamaguchi, Isao; Sasamori, Yusuke; and Takaoka, Hideo, 4,561,770, Cl. 355-57.000.

Matsushita Electric Works, Ltd.: *See*—
Hamabe, Takafumi; Imai, Hirozo; and Hara, Hikoyoshi, 4,561,326, Cl. 74-798.000.

Matsushita, Shuzo: *See*—
Omaki, Takanobu; Nakamura, Akiyoshi; Ishida, Masato; and Matsushita, Shuzo, 4,561,748, Cl. 354-403.000.

Matsuyama, Shinichi, to Canon Kabushiki Kaisha. Voltage control apparatus for a camera. 4,561,754, Cl. 354-484.000.

Mattedi, Bruno A.; and Watari, Hiromichi, to Analogic Corporation. Floating point arithmetic system and method with rounding anticipation. 4,562,553, Cl. 364-745.000.

Mattes, M. Jules: *See*—
Real, Francisco X.; Mattes, M. Jules; Houghton, Alan N.; Livingston, Philip O.; Lloyd, Kenneth O.; Oettgen, Herbert F.; and Old, Lloyd J., 4,562,160, Cl. 436-539.000.

Matthys, Robert J., to Honeywell Inc. Voltage control circuit. 4,562,526, Cl. 363-61.000.

Maudal, Inge; Niemeier, Byron M.; and Wedertz, Larry D., to General Dynamics Pomona Division. Steering mechanism for an explosively fired projectile. 4,561,357, Cl. 102-439.000.

Mauldin, Larry W.: *See*—
Hu, Victor L.; Mauldin, Larry W.; and Lee, John J., 4,561,449, Cl. 128-746.000.

Mauser-Werke Oberndorf GmbH: *See*—
Bertiller, Roland; Kellner, Gerd; and Peter, Bernhard, 4,561,340, Cl. 89-127.000.

Max, John K. Positive displacement piston flowmeter. 4,561,304, Cl. 73-247.000.

Max-Planck-Gesellschaft zur Foerderung de Wissenschafen E.V.: *See*—
Keilmann, Fritz; and Kussmaul, Karl-Wilhelm, 4,561,721, Cl. 350-162.170.

Maximum Technology: *See*—
Pankin, Sidney M., 4,562,517, Cl. 362-147.000.

Mayer, Andreas: *See*—
Jaussi, Francois A.; Mayer, Andreas; and Spinnler, Fritz W., 4,561,407, Cl. 123-559.000.

Mayer, Norbert: *See*—
Hieber, Konrad; and Mayer, Norbert, 4,562,089, Cl. 427-10.000.

Mazda Motor Corporation: *See*—
Kanno, Yoshiaki; and Nakazumi, Tadataka, 4,561,404, Cl. 123-492.000.
Matsumoto, Tokuichi, 4,561,389, Cl. 123-425.000.
Nakamoto, Hiromasa; Natsuaki, Yukinobu; Michihira, Osamu; and Shoji, Futoshi, 4,561,527, Cl. 192-4.00C.

Mazor, Boris B., to Coard, Floyd A., M.D. Fractured femur fixation system. 4,561,432, Cl. 128-92.0BA.

McAdams, Hugh P., to Texas Instruments Incorporated. CMOS Address buffer circuit. 4,561,702, Cl. 307-475.000.

McBiles, Carol D., to Motorola, Inc. Universal ultra-precision PSK modulator with time multiplexed modes of varying modulation types. 4,562,415, Cl. 332-9.00R.

McCaffrey, David J. A.: *See*—
Wilson, James; and McCaffrey, David J. A., 4,562,165, Cl. 502-33.000.

McCarthy, Shaun L., to Ford Motor Company. Mass airflow sensor with backflow detection. 4,561,303, Cl. 73-204.000.

McCombs, Norman R.; and Bansal, Ravinder K., to Greene & Kellogg, Inc. Single bed pressure swing adsorption gas separation system. 4,561,865, Cl. 55-25.000.

McCulloch, Alister L., to Chubb Australia Limited. Valve. 4,561,630, Cl. 251-84.000.

McCulloch Corporation: *See*—
Jackson, Robert V., 4,561,707, Cl. 315-209.0CD.

McDaniel, Roger L., Jr.; Portzer, Jeffrey W.; and Zaiko, Edward J., to Union Carbide Corporation. Preparation of 1,3,4-thiadiazole-5-sulfonamides. 4,562,260, Cl. 548-141.000.

McDermott International, Inc.: *See*—
Campo, Juan J.; and Crutti, John A., Sr., 4,561,803, Cl. 405-224.000.

McDonald, James A., to RCA Corporation. Automatic kinescope beam current limiter. 4,562,479, Cl. 358-243.000.

McDonnell Douglas Corporation: *See*—
Biferno, Michael A., 4,562,433, Cl. 340-716.000.

McDonough, Kevin C.; Laffitte, David S.; and Hughes, John M., to Texas Instruments Incorporated. Video display system using serial/-parallel access memories. 4,562,435, Cl. 340-798.000.

McFarlane, Norris B. Production of refractory materials. 4,561,885, Cl. 75-30.000.

McFarlane, Robert: *See*—
Frankfort, Eric J.; Kenney, George C., II; and McFarlane, Robert, 4,562,567, Cl. 369-106.000.

McFrisby, Samuel J., to Ulicne, Joseph A., a part interest. Collapsible sled apparatus, and methods of constructing and utilizing same. 4,561,665, Cl. 280-20.000.

McGrath, John: *See*—
Vincent, Geoffrey P. F.; Ing-Simmons, Nicholas K. D.; McGrath, John; and Conrad, Marvin C., 4,562,535, Cl. 364-200.000.

McIntosh, Arthur M., to Borg-Warner Corporation. Torque-limiting clutch with temperature-responsive rapid release mechanism. 4,561,529, Cl. 192-56.00R.

McKay, Dwight L.: *See*—
Bertus, Brent J.; and McKay, Dwight L., 4,562,167, Cl. 502-100.000.

McKee, Frederick B. Windows. 4,561,221, Cl. 52-171.000.

McKee, Harris B., to Frito-Lay, Inc. Method for feeding cookie preforms. 4,562,084, Cl. 426-502.000.

McKnight, James T.; and Silverstein, Paul, to Chesebrough-Ponds, Inc. Wound dressing. 4,561,435, Cl. 128-156.000.

McKnight, William S.: *See*—
Davis, Richard K.; and McKnight, William S., 4,562,392, Cl. 318-572.000.

McLennan, William R.: *See*—
Dreyer, Paul L.; and McLennan, William R., 4,561,472, Cl. 138-94.300.

McMullen, Tod. Auxiliary oil filtration system. 4,561,395, Cl. 123-196.00A.

McNally, Guy: *See*—
Gaskell, Philip S.; Lagadec, Roger; and McNally, Guy, 4,562,489, Cl. 360-39.000.

McRae, John: *See*—
Sjogren, Christer A.; McRae, John; and Reyes, Carlos, 4,562,339, Cl. 235-98.00R.

Mead Corporation, The: *See*—
Sanders, Frederick W., 4,562,137, Cl. 430-138.000.

Meade, Reginald E., to Dairyman's Cooperative Creamery Assoc. Spray drying apparatus and method. 4,561,192, Cl. 34-10.000.

Meckel, Lothar: *See*—
Mennemann, Karl; Gliemeroth, Georg; Ross, Ludwig; Speit, Burkhard; Geiler, Volkmar; Krolla, Hans-Georg; and Meckel, Lothar, 4,562,161, Cl. 501-59.000.

Meckstroth, Alan F. Pilot operated fluid control valve. 4,561,627, Cl. 251-11.000.

Medlin, Lewis B., Jr. Mounting bracket for a junction box. 4,561,615, Cl. 248-27.100.

Medosan Industrie Biochimiche Riunite S.p.A.: *See*—
Vita, Filippo, 4,562,178, Cl. 514-59.000.

MegaTape Corporation: *See*—
Gyi, Ko K., 4,561,610, Cl. 242-198.000.

Meier, Gunter, to Dorina Nahmaschinen GmbH. Sewn pattern arrangement to be produced by a zig zag sewing machine. 4,561,369, Cl. 112-266.100.

Meier, Rene , to Mentec Ag. Overcharge prevention arrangement. 4,561,940, Cl. 202-181.000.

Meinicke, Peter: *See—*
Goritz, Bernd; Huber, Johann; and Meinicke, Peter, 4,561,700, Cl. 303-36.000.

Melchior, Wayne R.: *See—*
Markle, Richard A.; and Melchior, Wayne R., 4,562,008, Cl. 260-465.400.

Meller, Moshe. Illumination for dental drills. 4,561,845, Cl. 433-29.000.

Mels, Sherman J.; Petrie, Brian C.; and Pokusa, Richard J., to Sherwin-Williams Company, The. Water reducible quaternary ammonium salt containing polymers. 4,561,952, Cl. 204-181.700.

Meng, Hsi: *See—*
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Mennemann, Karl; Gliemeroth, Georg; Ross, Ludwig; Speit, Burkhard; Geiler, Volkmar; Krolla, Hans-Georg; and Meckel, Lothar, to Schott Glaswerke. Optical and ophthalmic glass with refractive indices greater than or equal to 1.56, Abbe numbers greater than or equal to 40 and densities less than or equal to 2.70 g/cm³. 4,562,161, Cl. 501-59.000.

Mennen, Frederick C.; and Freake, Ronald. Self-contained swab cartridge apparatus for detecting occult blood. 4,562,043, Cl. 422-56.000.

Mentec Ag: *See—*
Meier, Rene , 4,561,940, Cl. 202-181.000.

Merck & Co., Inc.: *See—*
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Merkert, Rodney F.: *See—*
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Merkes, Dennis B.: *See—*
Hodel, Alfred; Merkes, Dennis B.; and Chari, Venu, 4,562,533, Cl. 364-200.000.

Merkle, Roland: *See—*
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Merlin Gerin: *See—*
Badon, Aime ; Berthonnier, Jean-Yves; and Mounier, Claude, 4,562,319, Cl. 200-144.0AP.
Bolongeat-Mobleu, Roger; Busin, Thierry; and Ravet, Jean-Paul, 4,562,321, Cl. 200-148.00A.
Plaige, Yves, 4,562,035, Cl. 376-215.000.

Merriman, Burt T., Jr.: *See—*
Fryd, Michael; and Merriman, Burt T., Jr., 4,562,100, Cl. 427-385.500.

Mesmer, Otto: *See—*
Troger, Wolfgang; Mesmer, Otto; and Friedrichs, Renate, 4,561,992, Cl. 252-155.000.

Messer Griesheim GmbH: *See—*
Gahrs, Hans J., 4,561,452, Cl. 131-297.000.

Messier-Hispaono-Bugatti (S.A.): *See—*
Masclet, Jean, 4,561,612, Cl. 244-104.00R.

METCO Inc.: *See—*
Spaulding, Mark F.; and Goehring, Richard A., 4,561,808, Cl. 406-118.000.

Metromedia, Inc.: *See—*
Rich, Leonard G., 4,562,445, Cl. 346-140.60R.

Meyer, Walter E.: *See—*
Tomcufcik, Andrew S.; Meyer, Walter E.; and Tseng, Shin S., 4,562,189, Cl. 514-252.000.

Meyer, Willy; and Fory, Werner, to Ciba-Geigy Corporation. N-(2-Haloalkoxy- and 2-haloalkylthiophenylsulfonyl)-N'-(halogenated-pyridinyl)ureas. 4,561,878, Cl. 71-92.000.

Meyer, Willy; Topfl, Werner; Kristinsson, Haukur; and Eckhardt, Wolfgang, to Ciba-Geigy Corporation. Bactericides. 4,562,210, Cl. 514-604.000.

MG Industries: *See—*
Brodbeck, Howard D.; and Krongold, Martin A., 4,561,258, Cl. 62-49.000.

Miba Gleitlager Aktiengesellschaft: *See—*
Ehrentraut, Otto; and Ederer, Ulf G., 4,561,787, Cl. 384-295.000.

Micaletti, Gilbert: *See—*
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Micetich, Ronald G.; Yamabe, Shigeru; Tanaka, Motoaki; Kajitani, Makoto; Yamazaki, Tomio; and Ishida, Naobumi, to Taiho Pharmaceutical Company Limited. Penicillin derivatives. 4,562,073, Cl. 424-114.000.

Michael, Charles T.: *See—*
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Michigan Seat Company: *See—*
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Michihira, Osamu: *See—*
Nakamoto, Hiromasa; Natsuaki, Yukinobu; Michihira, Osamu; and Shoji, Futoshi, 4,561,527, Cl. 192-4.00C.

Microlife Technics, Inc.: *See—*
King, Stephen W., 4,562,077, Cl. 426-13.000.

Midac Corporation: *See—*
Auth, Gerald L., 4,562,356, Cl. 250-458.100.

Mielke, Siegfried, to Karl Schmidt GmbH. Piston and process of providing wear-resisting surfaces in the ring grooves of an aluminum alloy combustion engine piston. 4,562,327, Cl. 219-76.110.

Migliarese-Caputi, Jean-Louis: *See—*
Quin, Rene ; Wiet, Paul; and Migliarese-Caputi, Jean-Louis, 4,561,248, Cl. 60-413.000.

Mihara, Shin-ichi; Imai, Toshihiro; Nakahashi, Ken-ichi; Iba, Youichi; Imaizumi, Masaki; and Taira, Akio, to Olympus Optical Co., Ltd. Automatic focus detecting mechanism for endoscopes. 4,562,344, Cl. 250-201.000.

Mikata, Yoshitaka: *See—*
Sakakibara, Sakuichi; Tokuda, Yoshiaki; Nagai, Tamio; Mikata, Yoshitaka; and Nishide, Kazuhiro, 4,561,509, Cl. 177-25.000.

Miki, Toshio: *See—*
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Miklos, Richard L., to Minnesota Mining and Manufacturing Company. Magnetic disk jacket and forming process. 4,562,504, Cl. 360-133.000.

Milanesi, Gabriele: *See—*
Ricciardi, Robert P.; Barbanti-Brodano, Giuseppe; and Milanesi, Gabriele, 4,562,155, Cl. 435-172.300.

Miles Laboratories, Inc.: *See—*
Sommer, Ronald G., 4,562,148, Cl. 435-7.000.

Miles, Ronald C.; and Justice, David D., to Olin Corporation. Apparatus and method for preventing activity loss from electrodes during shutdown. 4,561,949, Cl. 204-147.000.

Miller, Bernhard: *See—*
Bonitz, Jorg; Entenmann, Robert; Killi, Geza; Knab, Rochus; Miller, Bernhard; Rohde, Siegfried; and Viess, Walter, 4,562,544, Cl. 364-431.110.

Miller, Bryan H., to Continental Plastic Beverage Bottles, Inc. Plastic container having enlarged free end portion for receiving a metal end unit by double seaming. 4,561,555, Cl. 220-67.000.

Miller, Edward B.: *See—*
Beatty, Robert M.; Huber, Paul G.; and Miller, Edward B., 4,562,550, Cl. 364-492.000.

Miller, Ellsworth S.: *See—*
Slavin, Michael; Martus, Charles R.; and Miller, Ellsworth S., 4,561,631, Cl. 251-129.200.

Miller, Gerald D.: *See—*
Wykes, John H.; and Miller, Gerald D., 4,562,546, Cl. 364-434.000.

Miller, Kim C.: *See—*
Stanley, Carol A. J.; and Miller, Kim C., 4,561,122, Cl. 2-20.000.

Miller, Stephen J., to Chevron Research Company. One-step stabilizing and dewaxing of lube oils. 4,561,967, Cl. 208-120.000.

Milliken Research Corporation: *See—*
Machell, Greville, 4,562,265, Cl. 549-364.000.

Milsco Manufacturing Company: *See—*
Hill, Kevin E., 4,561,621, Cl. 248-397.000.

Minagawa, Shoichi: *See—*
Asai, Ryuichi; Okamato, Takeshi; and Minagawa, Shoichi, 4,562,371, Cl. 310-313.00A.

Minegishi, Kiyoji, to Sumitomo Heavy Industries, Ltd. Fluid pressure device. 4,561,833, Cl. 418-61.00B.

Ministry of International Trade and Industry: *See—*
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Kohno, Tsuguo; Yoshida, Yoshitaro; Tenjinbayashi, Koji; and Okazaki, Yuichi, 4,561,333, Cl. 82-1.00C.
Yamanobe, Takashi; Mitsuishi, Yasushi; and Takasaki, Yoshiyuki, 4,562,150, Cl. 435-99.000.

Minkkinen, Ari A., to Lummus Crest Inc. Heat and water recovery from aqueous waste streams. 4,561,965, Cl. 208-11.0LE.

Minnesota Mining and Manufacturing Company: *See—*
Collins, Leslie M.; and Zarr, Myron, 4,561,609, Cl. 242-192.000.
Dziki, Michael M., 4,561,569, Cl. 222-146.500.
Hu, Victor L.; Mauldin, Larry W.; and Lee, John J., 4,561,449, Cl. 128-746.000.
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Nelson, Norman E., 4,562,028, Cl. 264-160.000.
Rabuse, George R.; and Hanson, Gary R., 4,562,102, Cl. 428-43.000.
Sorlien, Mark D.; and Filreis, Manuel, 4,561,708, Cl. 339-14.00L.
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Minolta Camera Kabushiki Kaisha: *See—*
Matsuda, Motonobu; and Ito, Masatoshi, 4,561,746, Cl. 354-400.000.
Oka, Tateki, 4,562,130, Cl. 430-54.000.
Omaki, Takanobu; Nakamura, Akiyoshi; Ishida, Masato; and Matsushita, Shuzo, 4,561,748, Cl. 354-403.000.
Sugiura, Masamichi, 4,561,764, Cl. 355-8.000.
Sugiura, Masamichi, 4,561,771, Cl. 355-14.00R.
Tanaka, Susumu; and Takebe, Kaoru, 4,562,129, Cl. 430-42.000.

Minton, Thomas C., to Malicoat, Lewis M., Trustee. Variable stud welding chuck. 4,562,329, Cl. 219-99.000.

Miotk, Bernd: *See—*
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Mischenko, Peter S.; and Buehl, George T., to International Jensen Incorporated. Disc cleaner. 4,561,142, Cl. 15-97.00R.

Misevich, Kenneth W., to Colgate-Palmolive Company. Golf shoe sole structures for relieving spike-produced pressure points. 4,561,197, Cl. 36-127.000.

Mishiro, Shoji; and Hamada, Seiji, to Taga Electric Company Ltd. Driving frequency controlling method for an ultrasonic transducer driving apparatus. 4,562,413, Cl. 331-116.00R.

Mistyurik, John D.: *See—*
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Mitamura, Hideyuki: *See—*
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Mito, Ikuo, to NEC Corporation. Process for epitaxial growth on a corrugated wafer. 4,561,915, Cl. 148-171.000.
Mitsubishi Chemical Industries Limited: *See*—
Hashizume, Hiroshi; and Izumisawa, Yoshiaki, 4,562,285, Cl. 562-414.000.
Kikumoto, Ryoji; Tobe, Akihiro; Tonomura, Shinji; and Ikoma, Hidenobu, 4,562,211, Cl. 514-648.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
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Fujimoto, Tsunetomo, 4,562,360, Cl. 307-149.000.
Hara, Masanori; and Sugawara, Sakuo, 4,561,422, Cl. 126-110.00R.
Kanno, Yoshiaki; and Nakazumi, Tadataka, 4,561,404, Cl. 123-492.000.
Kawabata, Masaru; Furukawa, Teruo; and Ishibashi, Michiyasu, 4,562,491, Cl. 360-51.000.
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Mitsubishi Gas Chemical Company, Inc.: *See*—
Kuriyama, Yasuhisa; Kajiwara, Syoichiro; and Ozaki, Fumikazu, 4,561,982, Cl. 210-698.000.
Mitsubishi Paper Mills, Ltd.: *See*—
Kohmura, Isao; Miura, Jun; and Kajima, Norio, 4,562,140, Cl. 430-244.000.
Mitsubishi Rayon Co., Ltd.: *See*—
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Mitutoyo Mfg. Co., Ltd.: *See*—
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Miyake, Masao; and Akita, Teruo, to Asahi Kasei Textiles Ltd. Heat-retaining moisture-transmissible water-resistant fabric. 4,562,108, Cl. 428-212.000.
Miyake, Toshio: *See*—
Hijiya, Hiromi; and Miyake, Toshio, 4,562,020, Cl. 264-39.000.
Miyamoto, Hidenori; and Saegusa, Takashi, to Nippon Kogaku K.K. Metering device of a camera. 4,561,752, Cl. 354-432.000.
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Miyaoka, Shinichiro; Sekozawa, Teruji; Funabashi, Motohisa; and Hayashi, Shinobu, to Hitachi, Ltd.; and Hitachi Control Systems Inc. Method and apparatus for controlling pressure and flow in water distribution networks. 4,562,552, Cl. 364-510.000.
Miyata, Shigeo, to Kyowa Chemical Industry Co., Ltd. Method of purifying cyclohexanone containing by-product organic acids. 4,562,295, Cl. 568-366.000.
Miyatake, Satoshi; Abe, Mitsuo; Kume, Masao; Yonemura, Shigehiro; and Umino, Hiroshi, to Honda Giken Kogyo Kabushiki Kaisha. Workpiece engaging apparatus in grinding machines. 4,561,216, Cl. 51-165.920.
Miyazaki, Haruo; Yamasaki, Yasuaki; and Oshiyama, Tsutomu, to Nikkiso Co. Ltd. Insulation of a coil used in electrical apparatus. 4,562,164, Cl. 501-151.000.
Miyazaki, Hiroshi: *See*—
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Miyazaki, Masaru; Takahashi, Susumu; Kohashi, Takahiro; and Ueyanagi, Kiichi, to Hitachi, Ltd. Method of manufacturing semiconductor device utilizing multilayer mask. 4,561,169, Cl. 29-571.000.
Miyazawa, Kazuyuki: *See*—
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Miyazawa, Yoshiaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Uninterruptible power supply and a starting method. 4,562,357, Cl. 307-66.000.
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Miyoshi, Motosuke: *See*—
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Mizoshita, Yoshifumi, to Fujitsu Limited. Magnetic disk unit. 4,562,499, Cl. 360-98.000.
Mizumukai, Ken; Masamura, Tatuya; and Yamanaka, Hiroshi, to Kayaba Kogyo Kabushiki Kaisha. Damping force regulation device for telescope shock absorber. 4,561,524, Cl. 188-319.000.
Mizuno Corporation: *See*—
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Mochizuki, Kazuo; Nakakoji, Hisatada; Ichida, Toshio; Irie, Toshio; Ogata, Hajime; and Yamaji, Kyoko, to Kawasaki Steel Corporation. Process for preparing surface-treated steel strips adapted for electric resistance welding and strips produced by said process. 4,561,943, Cl. 204-28.000.
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Modine Manufacturing Company: *See*—
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Moenkhaus, Patrick R., to Honeywell Inc. Flue gas analyzer with carbon monoxide detector. 4,561,288, Cl. 73-23.000.
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Tokumori, Yutaka; Mokuda, Osamu; Ikeda, Tadasu; Takeda, Akira; Tominaga, Masato; and Mashiba, Hiroto, 4,562,071, Cl. 424-94.000.
Moles, Oliver W.; Ensley, Kenneth L.; and Perkins, Haywood A., to Kerr-McGee Chemical Corporation. Process for the treatment of metal-bearing ores. 4,562,048, Cl. 423-81.000.
Molignoni, Albert J., to Power Shaft Engine. External combustion engine. 4,561,256, Cl. 60-692.000.
Molinelli, John J.: *See*—
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Molins PLC: *See*—
Hinchcliffe, Dennis, 4,562,099, Cl. 427-282.000.
Moller, Hinrich; and Wallat, Siegfried, to Henkel Kommanditgesellschaft auf Aktien. Sebosuppressive cosmetic preparations containing aryloxobutenoic acid derivatives. 4,562,068, Cl. 424-70.000.
Monarch Marking Systems, Inc.: *See*—
Hamisch, Paul H., Jr.; and Mistyurik, John D., 4,561,926, Cl. 156-381.000.
Monroe Electronics, Inc.: *See*—
Conway, John T.; and Albone, Robert C., 4,562,429, Cl. 340-657.000.
Monroy, Agustin: *See*—
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Monsanto Company: *See*—
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Venturello, Carlo; and Gambaro, Mario, 4,562,299, Cl. 568-811.000.
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Randar, Magnus; and Moore, David G., 4,561,155, Cl. 29-33.00M.
Moore, Dennis K.: *See*—
Moore, Joseph L.; Moore, R. Keith; and Moore, Dennis K., 4,561,240, Cl. 56-328.00R.
Moore, Joseph L.; Moore, R. Keith; and Moore, Dennis K., to Proficient Systems, Inc. Apparatus for retrieving objects from the ground. 4,561,240, Cl. 56-328.00R.
Moore, R. Keith: *See*—
Moore, Joseph L.; Moore, R. Keith; and Moore, Dennis K., 4,561,240, Cl. 56-328.00R.
Moore, Thomas L. Knife holster. 4,561,577, Cl. 224-232.000.
Moorehead, Eric L., to Union Oil Company of California. Method of producing maleic anhydride. 4,562,269, Cl. 549-259.000.
Moran, Francis, to Societe Anonyme dite: Union Chimique et Industrielle de l'Ouest (U.C.I.O.-S.A.). Anticorrosive composition. 4,562,042, Cl. 422-13.000.
Moran, Richard J., to Cooper Industries, Inc. Distribution line powered switchgear control. 4,562,506, Cl. 361-71.000.
Moreland, Roger; and Moreland, William. Fence post driving assembly. 4,561,636, Cl. 254-29.00R.
Moreland, William: *See*—
Moreland, Roger; and Moreland, William, 4,561,636, Cl. 254-29.00R.

Moret, Michel-Antoine; Cuenoud, Gerard; and Jousson, Pierre-Jean, to Les Produits Associes LPA SA. Hydraulic apparatus. 4,561,251, Cl. 60-537.000.
Moretti, Anthony L.: *See—*
Brockway, Brock F.; Moretti, Anthony L.; Pellolio, Anselmo P.; and Rasmussen, Jimmie, 4,561,162, Cl. 29-428.000.
Mori, Hiroshi: *See—*
Kishida, Kazuo; Sasaki, Isao; and Mori, Hiroshi, 4,562,216, Cl. 523-433.000.
Morimoto, Keisuke, to General Foods Corporation. Extruded shrimp analog formed from vegetable protein and starch complex. 4,562,082, Cl. 426-104.000.
Morinaga, Kaoru; Kawakami, Hiroshi; and Kotoda, Yoshihiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Tape drive spindle. 4,562,497, Cl. 360-96.300.
Morita, Akira: *See—*
Sasaki, Hirokazu; Morita, Akira; and Yamamoto, Takemasa, 4,561,944, Cl. 204-33.000.
Morita, Tatsuo: *See—*
Hata, Yoshitaka; and Morita, Tatsuo, 4,561,401, Cl. 123-486.000.
Morita, Toyoo, to Yoshida Kogyo K.K. Method of and apparatus for automatically attaching top stops to a gapped slide fastener chain with slides mounted thereon. 4,561,161, Cl. 29-408.000.
Moriwaki, Hisayoshi: *See—*
Odaka, Kentaro; Sako, Yoichiro; Kojima, Yuichi; Nakano, Kenji; and Moriwaki, Hisayoshi, 4,562,578, Cl. 371-40.000.
Moriya, Mitsuro; Kanamaru, Toshiji; and Nakata, Yoshinobu, to Matsushita Electric Industrial Co., Ltd. Tracking system for controlling the radial positioning of a transducer on a disc medium. 4,562,562, Cl. 369-32.000.
Moro, Brigitte: *See—*
Jahnke, Horst; Moro, Brigitte; Scholz, Erich; and Siebke, Hans, 4,562,431, Cl. 340-604.000.
Morris, Charles F., Jr.: *See—*
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Morrison, David A.: *See—*
Kinsman, Gordon F.; Lambert, Ronald F.; and Morrison, David A., 4,561,745, Cl. 354-299.000.
Morton Thiokol, Inc.: *See—*
Adams, Gary V.; Ahlf, Wilbur J.; Kirchoff, George F.; and Lange, Rholand E., 4,561,675, Cl. 280-734.000.
Youngkeit, Dean, 4,561,377, Cl. 118-33.000.
Mortvedt, Raymond L., to Ektelon. Tubular steel racquet frame having varying cross-section. 4,561,655, Cl. 273-73.00H.
Mosher, Mark D., to Motorola, Inc. Compression molding against an insert. 4,562,026, Cl. 264-135.000.
Moss, Charles M.: *See—*
Walter, Robert J.; Lewis, Jack R.; and Moss, Charles M., 4,562,332, Cl. 219-121.0EM.
Motoo, Akihiko. to Japan Steel Works, Ltd., The. Method of joining members difficult to fusion weld. 4,562,331, Cl. 219-121.0ED.
Motorola, Inc.: *See—*
Hansen, Kenneth A.; and Kurtzman, Gary A., 4,562,405, Cl. 330-51.000.
Linder, Donald L.; and Murphy, William R., 4,562,414, Cl. 332-9.00R.
McBiles, Carol D., 4,562,415, Cl. 332-9.00R.
Mosher, Mark D., 4,562,026, Cl. 264-135.000.
Schultz, Warren J.; and Saladin, Herbert A., 4,562,454, Cl. 357-51.000.
Townsend, Greg M., 4,562,575, Cl. 371-9.000.
Mounier, Claude: *See—*
Badon, Aime ; Berthonnier, Jean-Yves; and Mounier, Claude, 4,562,319, Cl. 200-144.0AP.
Mouri, Hideto; and Inoue, Nobuhiro, to Tachikawa Spring Co., Ltd. Reclining adjuster for car seat. 4,561,694, Cl. 297-379.000.
Mouri, Masahide: *See—*
Yamada, Koichi; Mouri, Masahide; and Nomura, Yoshisaburo, 4,562,040, Cl. 419-23.000.
Mroz, Edward, to Verbatim Corporation. Flexible magnetic memory disk with metallic hub and method of manufacturing same. 4,562,505, Cl. 360-135.000.
Muir, Ronald C.: *See—*
Fulghum, Donald R.; and Muir, Ronald C., 4,561,643, Cl. 269-43.000.
Mulcahy, Harry W., to AMSTED Industries Incorporated. Single axle suspension system for railroad vehicle. 4,561,360, Cl. 105-199.00S.
Mulder, Douglas C.; and O'Ryan, David E., to Nordson Corporation. Method and apparatus for powder coating a moving web. 4,561,380, Cl. 118-688.000.
Mullen, John T.: *See—*
Underwood, Stephen C.; and Mullen, John T., 4,561,480, Cl. 150-49.000.
Muller, Hanns P.: *See—*
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Muller, Herbert: *See—*
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Mullin, Christopher A.: *See—*
Hammock, Bruce D.; and Mullin, Christopher A., 4,562,292, Cl. 568-043.000.
Mullins, Ronald L.: *See—*
Carpenter, James H.; Mullins, Ronald L.; and Smith, Ronald L., 4,561,220, Cl. 51-427.000.
Mullner, Paul; Enkner, Bernhard; and Hubweber, Gerhard, to Voest-Alpine Aktiengesellschaft. Method of producing metals or metal alloys and an arrangement therefor. 4,561,883, Cl. 75-10.00R.
Mumford, Van E.: *See—*
Vollmann, William; and Mumford, Van E., 4,561,442, Cl. 128-419.0PG.
Mummert, Thomas A., to Jobst Institute, Inc. Sequencing valve mechanism. 4,561,343, Cl. 91-37.000.
Munnekehoff, Gerd: *See—*
Schippers, Heinz; and Munnekehoff, Gerd, 4,561,602, Cl. 242-35.50A.
Munnerlyn, Charles R., to Cooper LaserSonics, Inc. Optical system for surgical ophthalmic laser instrument. 4,561,436, Cl. 128-303.100.
Munters Corporation, The: *See—*
Lefevre, Marcel R., 4,562,015, Cl. 261-94.000.
Murai, Atsushi: *See—*
Terano, Minoru; Kimura, Kouhei; Murai, Atsushi; Inoue, Masuo; and Miyoshi, Katsuyoshi, 4,562,173, Cl. 502-127.000.
Muralidhara, Harapanahalli; Parekh, Bhupendra; and Senapati, Nagabhusan, to Battelle Memorial Institute. Solid-liquid separation process for fine particle suspensions by an electric and ultrasonic field. 4,561,953, Cl. 204-182.300.
Murano, Kazuo; Soejima, Tetsuo; and Amemiya, Shigeo, to Fujitsu Limited. Method and apparatus for adjusting channel insertion timing. 4,562,573, Cl. 370-85.000.
Murase, Zenzaburo: *See—*
Hiramitsu, Tetsushi; Sugita, Hiroshi; Ono, Satoshi; and Murase, Zenzaburo, 4,561,324, Cl. 74-498.000.
Murata Manufacturing Co.: *See—*
Murata, Michihiro, 4,562,045, Cl. 422-102.000.
Murata Manufacturing Co., Ltd.: *See—*
Futakuchi, Tomoaki, 4,562,404, Cl. 329-118.000.
Nakamura, Takeshi; Matsumoto, Ikuo; and Ando, Kenji, 4,562,372, Cl. 310-321.000.
Murata, Michihiro, to Murata Manufacturing Co. Carrier for holding analytical samples. 4,562,045, Cl. 422-102.000.
Murata, Nobuo: *See—*
Takahashi, Toshikatsu; and Murata, Nobuo, 4,561,774, Cl. 355-75.000.
Murayama, Noboru: *See—*
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Murphy, William R.: *See—*
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Murti, Dasarao K.: *See—*
Ong, Beng S.; Keoshkerian, Barkev; Murti, Dasarao K.; and Mammino, Joseph, 4,562,132, Cl. 430-59.000.
Muryobayashi, Takashi: *See—*
Imaki, Katsuhiro; Muryobayashi, Takashi; and Kawasaki, Akiyoshi, 4,562,207, Cl. 514-573.000.
Musschoot, Albert, to General Kinematics Corporation. Apparatus for grinding, milling, crushing, scrubbing, sizing and/or classifying material. 4,561,598, Cl. 241-19.000.
Mutoh, Nobuyoshi; Sakai, Keijiro; Hattori, Motonobu; and Nagato, Yuichiro, to Hitachi, Ltd. Control apparatus for PWM inverter. 4,562,524, Cl. 363-41.000.
Myers, Gerald A.: *See—*
Martens, Alan; Hobbs, Milton M.; and Myers, Gerald A., 4,561,254, Cl. 60-660.000.
Myers, John G.: *See—*
Zupanovich, John D.; and Myers, John G., 4,561,897, Cl. 106-14.140.
Naarden International N.V.: *See—*
Roehl, Ernst-Ludwig, 4,561,997, Cl. 252-522.00A.
Nabisco Brands, Inc.: *See—*
Tenn, Faozy E., 4,562,080, Cl. 426-94.000.
Naft, Manny H.: *See—*
DeYoung, Simon A.; and Naft, Manny H., 4,561,641, Cl. 267-64.130.
Nagai, Kenji; and Fujii, Fumiaki, to Hitachi, Ltd. Amplifier having a high power source noise repression ratio. 4,562,408, Cl. 330-253.000.
Nagai, Norimichi; Horiishi, Nanao; Kiyama, Masao; and Takada, Toshio, to Toda Kogyo Corporation. Process for production of plate-like barium ferrite particles for magnetic recording. 4,561,988, Cl. 252-62.590.
Nagai, Tamio: *See—*
Sakakibara, Sakuichi; Tokuda, Yoshiaki; Nagai, Tamio; Mikata, Yoshitaka; and Nishide, Kazuhiro, 4,561,509, Cl. 177-25.000.
Nagamune, Teruyuki; Inoue, Ichiro; and Takematsu, Noburu, to Rikagaku Kenkyusho. Instrument for measuring concentration of substance in suspension. 4,561,779, Cl. 356-442.000.
Nagano, Katsumasa: *See—*
Sekiguchi, Shizuo; Kitano, Kyozo; and Nagano, Katsumasa, 4,561,999, Cl. 252-557.000.
Nagase, Masaomi: *See—*
Tsukamoto, Keisuk; Nagase, Masaomi; and Matsuno, Kiyotaka, 4,561,397, Cl. 123-357.000.
Nagashima, Masayoshi; and Yamane, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Thermal transfer electroprinting apparatus. 4,562,444, Cl. 346-76.0PH.
Nagashima, Takashi: *See—*
Adachi, Yoshiharu; Ando, Masamoto; and Nagashima, Takashi, 4,561,699, Cl. 303-24.00F.

Nagashima, Yoshimitsu, to Silver Seiko Ltd. Alternate ribbon feed mechanism for fabric and carbon ribbon cassettes. 4,561,791, Cl. 400-208.000.
Nagata, Ryuichi: *See*—
Otaki, Toshihiro; Nagata, Ryuichi; and Yoshii, Toshiya, 4,561,724, Cl. 350-334.000.
Nagata, Shoji: *See*—
Ohashi, Naohito; Nagata, Shoji; and Ishizumi, Kikuo, 4,562,263, Cl. 548-479.000.
Nagato, Yuichiro: *See*—
Mutoh, Nobuyoshi; Sakai, Keijiro; Hattori, Motonobu; and Nagato, Yuichiro, 4,562,524, Cl. 363-41.000.
Nagler, Werner: *See*—
Kopetzky, Horst; Nagler, Werner; and Ossler, Walter, 4,562,308, Cl. 179-18.0FA.
Naguib, Hussein M.: *See*—
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Nakae, Hideo: *See*—
Nakajima, Tadakatsu; Nakayama, Wataru; Daikoku, Takahiro; Kuwahara, Heikichi; Yasukawa, Akira; Kasuya, Katsuhiko; Yokoi, Kazuaki; Nakae, Hideo; and Yoshida, Hiromichi, 4,561,497, Cl. 165-133.000.
Nakagiri, Fumiki: *See*—
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Nakahara, Akihiro: *See*—
Tominaga, Ichiro; and Nakahara, Akihiro, 4,561,657, Cl. 273-218.000.
Nakahashi, Ken-ichi: *See*—
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Nakajima, Hideki, to Shimano Industrial Company Limited. Brake for a fishing reel. 4,561,605, Cl. 242-84.52B.
Nakajima, Kichio: *See*—
Watanabe, Hiroshi; Izumi, Eiki; Aoyagi, Yukio; Honma, Kazuo; and Nakajima, Kichio, 4,561,249, Cl. 60-421.000.
Nakajima, Tadakatsu; Nakayama, Wataru; Daikoku, Takahiro; Kuwahara, Heikichi; Yasukawa, Akira; Kasuya, Katsuhiko; Yokoi, Kazuaki; Nakae, Hideo; and Yoshida, Hiromichi, to Hitachi, Ltd.; and Hitachi Cable Ltd. Heat transfer surface and manufacturing method for same. 4,561,497, Cl. 165-133.000.
Nakakoji, Hisatada: *See*—
Mochizuki, Kazuo; Nakakoji, Hisatada; Ichida, Toshio; Irie, Toshio; Ogata, Hajime; and Yamaji, Kyoko, 4,561,943, Cl. 204-28.000.
Nakamoto, Hiromasa; Natsuaki, Yukinobu; Michihira, Osamu; and Shoji, Futoshi, to Mazda Motor Corporation. Electric parking brake system for a vehicle. 4,561,527, Cl. 192-4.00C.
Nakamura, Akiyoshi: *See*—
Omaki, Takanobu; Nakamura, Akiyoshi; Ishida, Masato; and Matsushita, Shuzo, 4,561,748, Cl. 354-403.000.
Nakamura, Junichi: *See*—
Aoki, Masahiro; Nakamura, Junichi; Ida, Masatoshi; Oinoue, Kenichi; and Hayashi, Asao. 4,562,345, Cl. 250-201.000.
Nakamura, Kazuharu; and Tsuboi, Yoshimasa, to Toyotomi Kogyo Co., Ltd. Safety device for oil burner. 4,561,840, Cl. 431-22.000.
Nakamura, Munekazu: *See*—
Asaoka, Sachio; Sendo, Takashi; and Nakamura, Munekazu, 4,562,059, Cl. 423-626.000.
Nakamura, Norihiko; Baika, Toyokazu; Shibata, Yoshiaki; and Miki, Toshio, to Toyota Jidosha Kabushiki Kaisha; and Koyo Seiko Kabushiki Kaisha. Variable valve-timing apparatus in an internal combustion engine. 4,561,390, Cl. 123-90.150.
Nakamura, Norihiko: *See*—
Teramura, Mitsuyoshi; Takimoto, Masatami; Nakamura, Norihiko; Itoh, Takaaki; Katou, Takashi; and Isoya, Yukinori, 4,562,012, Cl. 261-44.00C.
Nakamura, Shigeo: *See*—
Hattori, Masayuki; Nakamura, Shigeo; and Yairo, Osamu, 4,562,361, Cl. 307-270.000.
Nakamura, Takeshi; Matsumoto, Ikuo; and Ando, Kenji, to Murata Manufacturing Co., Ltd. Piezoelectric vibrating element having a rectangular configuration. 4,562,372, Cl. 310-321.000.
Nakamura, Yoshiharu: *See*—
Shinjo, Tuneo; Nakamura, Yoshiharu; and Chikaraishi, Takayo, 4,561,690, Cl. 296-155.000.
Nakano, Jiro; Ishibashi, Takao; Akatsuka, Takao; and Takata, Mamoru, to Toyota Jidosha Kabushiki Kaisha. Method and system for internal combustion engine oxygen sensor heating control, synchronizing heater voltage detection with heater energization, and calculating power loss. 4,561,402, Cl. 123-489.000.
Nakano, Kenji: *See*—
Odaka, Kentaro; Sako, Yoichiro; Kojima, Yuichi; Nakano, Kenji; and Moriwaki, Hisayoshi, 4,562,578, Cl. 371-40.000.
Nakano, Masateru: *See*—
Nishitani, Yoshihisa; Nakano, Masateru; and Yamamoto, Yoshihito, 4,562,493, Cl. 360-74.100.
Nakata, Yoshinobu: *See*—
Moriya, Mitsuro; Kanamaru, Toshiji; and Nakata, Yoshinobu, 4,562,562, Cl. 369-32.000.
Nakayama, Noritaka: *See*—
Masuda, Kosaku; Miyagi, Kaoru; Katoh, Katsunori; Nakayama, Noritaka; Kimura, Toshihiko; and Kawakatsu, Satoshi, 4,562,146, Cl. 430-546.000.
Nakayama, Wataru: *See*—
Nakajima, Tadakatsu; Nakayama, Wataru; Daikoku, Takahiro; Kuwahara, Heikichi; Yasukawa, Akira; Kasuya, Katsuhiko; Yokoi, Kazuaki; Nakae, Hideo; and Yoshida, Hiromichi, 4,561,497, Cl. 165-133.000.
Nakazumi, Tadataka: *See*—
Kanno, Yoshiaki; and Nakazumi, Tadataka, 4,561,404, Cl. 123-492.000.
Nalbach, John C., to John R. Nalbach Engineering Co., Inc. Container orienting apparatus. 4,561,534, Cl. 198-400.000.
Namiki, Takayuki: *See*—
Teraji, Tsutomu; Todo, Eishiro; Shimazaki, Norihiko; Oku, Teruo; and Namiki, Takayuki, 4,562,179, Cl. 514-77.000.
Nantz, Milton J. Method and apparatus for inhibiting erosion. 4,561,801, Cl. 405-15.000.
Narabayashi, Tadashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus for measuring void ratios by using radiation. 4,562,584, Cl. 378-54.000.
Narasimhan, Tanjore R., to Analog Devices, Incorporated. Temperature-compensated zener voltage reference. 4,562,400, Cl. 323-281.000.
Natansohn, Almeria, to Yeda Research and Development Company Limited. Polymers photoconductive in the near infra-red. 4,562,133, Cl. 430-80.000.
Natarelli, Gerard E.: *See*—
Steltenkamp, Robert J.; Douglass, Miriam L.; and Natarelli, Gerard E., 4,562,064, Cl. 424-49.000.
National Institute for Researches in Inorganic Materials: *See*—
Endo, Tadashi; Sato, Tadao; and Fukunaga, Osamu, 4,562,163, Cl. 501-96.000.
National Research Development Corp.: *See*—
Carlow, Charles A., 4,561,545, Cl. 209-564.000.
Lowe, Christopher R.; and Earley, Fergus G. P., 4,562,157, Cl. 435-291.000.
Natsuaki, Yukinobu: *See*—
Nakamoto, Hiromasa; Natsuaki, Yukinobu; Michihira, Osamu; and Shoji, Futoshi, 4,561,527, Cl. 192-4.00C.
Navarro, Carlos R., to Concast Service Union AG. Method of, and apparatus for, continuously casting a curved strand using a curved rigid dummy bar. 4,561,490, Cl. 164-483.000.
Navarro, Luis J.: *See*—
Jones, Roydn; Dagostino, Thomas P.; and Navarro, Luis J., 4,562,363, Cl. 307-351.000.
Navarro, Richard R., to Nordson Corporation. Process and apparatus for maintaining a constant flow rate in a painting system. 4,562,088, Cl. 427-8.000.
Navia, Jaime A.: *See*—
Pak, Jungho; and Navia, Jaime A., 4,562,480, Cl. 358-248.000.
Nawata, Yoshiaki; and Oushiden, Hideshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Copying apparatus with focus-adjusting mechanism. 4,561,758, Cl. 355-8.000.
Nawata, Yoshiaki: *See*—
Watanabe, Junji; and Nawata, Yoshiaki, 4,561,762, Cl. 355-3.00R.
NCR Corporation: *See*—
Ecton, William W., 4,562,427, Cl. 340-825.500.
Hodel, Alfred; Merkes, Dennis B.; and Chari, Venu, 4,562,533, Cl. 364-200.000.
NEC Corporation: *See*—
Kambayashi, Yuusaku, 4,562,574, Cl. 370-100.000.
Koga, Toshio, 4,562,468, Cl. 358-136.000.
Mito, Ikuo, 4,561,915, Cl. 148-171.000.
Sugawara, Mitsutoshi; Tokuda, Kazuo; and Sawataishi, Tokio, 4,562,412, Cl. 331-53.000.
Neckers, Douglas C. Method for polymerizing a bis(allyl carbonate). 4,561,951, Cl. 522-33.000.
Neefe, Charles W. Method of casting optical surfaces on lens blanks. 4,562,018, Cl. 264-2.700.
Negi, Virendra S.: *See*—
Keeley, James W.; Ledoux, Robert V.; and Negi, Virendra S., 4,562,536, Cl. 364-200.000.
Negishi, Hideo, to Sanden Corporation. Article dispensing mechanism for a vending machine or the like. 4,561,564, Cl. 221-64.000.
Neiditch, Oscar W.; Hurdle, Edmund S.; and Fox, Daniel J., to Lever Brothers Company. Homogeneous aqueous fabric softening composition with stilbene sulfonic acid fluorescent whitener. 4,562,002, Cl. 252-8.750.
Nelson, Arthur R., to Sperry Corporation. Photoelastic effect optical waveguides. 4,561,718, Cl. 350-96.140.
Nelson, Craig E.; and Strenge, Marvin L., to TAB Leasing. Thermally isolated calibration apparatus. 4,561,285, Cl. 73-1.00B.
Nelson, Norman E., to Minnesota Mining and Manufacturing Company. Method for producing a bowed cassette shim. 4,562,028, Cl. 264-160.000.
Nelson Research & Development: *See*—
Horn, Alan S.; and Agoston, Sandor, 4,562,196, Cl. 514-332.000.
Nelson Research & Development Co.: *See*—
Rajadhyaksha, Vithal J., 4,562,075, Cl. 514-788.000.
Neri, Carlo; Giroldini, Villiam; Traversoni, Mario; Guizzi, Guido; Perrotti, Emilio; and Rinaldi, Antonio, to Enichimica Secondaria, S.p.A. Process for the preparation of 2,3-dihydro-2,2-dimethyl-7-benzofuranol. 4,562,266, Cl. 549-462.000.
Nessel, Eliezer: *See*—
Porat, Reuven; and Nessel, Eliezer, 4,561,809, Cl. 407-114.000.
Neumann, Gerhard, to Robert Bosch GmbH. Thermal deburring apparatus and method. 4,561,839, Cl. 431-6.000.
New Balance Athletic Shoe, Inc.: *See*—
Graham, Kenneth W.; Norton, Edward J.; and Kurata, Shuhei, 4,561,140, Cl. 12-146.0BR.

Newman, Robert: *See*—
Gold, Stanley; Newman, Robert; and Lavigne, Eric, 4,561,223, Cl. 52-202.000.
Newsam, Susan M.: *See*—
Johnson, Frank C.; and Newsam, Susan M., 4,562,033, Cl. 264-510.000.
Newton, Milton A., Jr. Tilt adjustable starting block. 4,561,650, Cl. 272-105.000.
Nicol, Paul G.; and Nicol, William W. Method of altering a conventional tub for the handicapped. 4,561,160, Cl. 29-401.100.
Nicol, Roger: *See*—
Bernard, Jacques; Rovel, Jean-Marie; Nicol, Roger; and Prevot, Claude, 4,561,974, Cl. 210-151.000.
Nicol, William W.: *See*—
Nicol, Paul G.; and Nicol, William W., 4,561,160, Cl. 29-401.100.
Niebes, Paul J.: *See*—
Cavalier, Robert G.; Cordi, Alexis A.; Gillet, Claude L.; Janssens de Varebeke, Philippe M.; Niebes, Paul J.; Roba, Joseph L.; Van Dorsser, William R.; Lambelin, Georges E.; and Franz, Michel R., 4,562,205, Cl. 514-546.000.
Niedecker, Herbert. Apparatus for closing tubular wrappers. 4,561,583, Cl. 227-109.000.
Niedzielski, James H.: *See*—
Weaver, Richard A.; Niedzielski, James H.; and Prime, Ronald M., 4,561,536, Cl. 198-481.100.
Nielsen, Peter B., to F. L. Smidth & Co. A/S. Apparatus for burning pulverulent raw material. 4,561,842, Cl. 432-106.000.
Nielsen, Richard H.: *See*—
Hays, George E.; Nielsen, Richard H.; Bowen, Chester O.; and Holland, Floyd H., 4,562,046, Cl. 422-140.000.
Niemeier, Byron M.: *See*—
Maudal, Inge; Niemeier, Byron M.; and Wedertz, Larry D., 4,561,357, Cl. 102-439.000.
Niessen, Anton K.: *See*—
Gerkema, Jan; Niessen, Anton K.; and Pelzer, Jozef B., 4,562,587, Cl. 378-133.000.
Nihei, Ryo: *See*—
Inaba, Hajimu; Sakakibara, Shinsuke; and Nihei, Ryo, 4,562,551, Cl. 364-513.000.
Niimi, Kiwamu; and Kinoshita, Kenji, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Draft roll system for spinning machines. 4,561,152, Cl. 19-244.000.
Nijhuis, Johan W., to Machinefabriek G. J. Nijhuis B.V. Method of influencing the quality, in particular the tenderness of meat of slaughtered animals by means of an electric current. 4,561,149, Cl. 17-45.000.
Nikkiso Co. Ltd.: *See*—
Miyazaki, Haruo; Yamasaki, Yasuaki; and Oshiyama, Tsutomu, 4,562,164, Cl. 501-151.000.
Nilssen, Andrew H.: *See*—
Ward, Jean R.; and Nilssen, Andrew H., 4,562,304, Cl. 178-18.000.
Nippon, Colin Co., Ltd.: *See*—
Kawamura, Norio; Yokoe, Hifumi; and Tsuda, Hideichi, 4,561,447, Cl. 128-687.000.
Nippon Electric Co., Ltd.: *See*—
Fuse, Mamoru, 4,562,451, Cl. 357-13.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Wachi, Masatada, 4,561,337, Cl. 84-1.010.
Nippon Kayaku Kabushiki Kaisha: *See*—
Shimano, Shizuo; Kobayashi, Shinichi; Yanagi, Mikio; Yamada, Osamu; Shida, Atsuhiko; and Futatsuya, Fumio, 4,561,880, Cl. 71-92.000.
Nippon Kogaku K.K.: *See*—
Hagyuda, Nobuyoshi, 4,561,751, Cl. 354-418.000.
Ishizaka, Sunao; and Maida, Osamu, 4,561,741, Cl. 354-21.000.
Miyamoto, Hidenori; and Saegusa, Takashi, 4,561,752, Cl. 354-432.000.
Utagawa, Ken, 4,561,749, Cl. 354-406.000.
Nippon Light Metal Co., Ltd.: *See*—
Sasaki, Hirokazu; Morita, Akira; and Yamamoto, Takemasa, 4,561,944, Cl. 204-33.000.
Nippon Mektron Ltd.: *See*—
Kameda, Eiichi; and Tobe, Seiichi, 4,562,301, Cl. 174-68.500.
Nippon Piston Ring Kabushiki Kaisha: *See*—
Sakamaki, Hiroshi; Sugishita, Susumu; and Horikoshi, Yukio, 4,561,835, Cl. 418-173.000.
Nippon Seiko Kabushiki Kaisha: *See*—
Tanaka, Kenji, 4,561,788, Cl. 384-513.000.
Nippon Soken, Inc.: *See*—
Idogaki, Takaharu; Hayashi, Ikuo; Kawai, Hisasi; Hattori, Kyo; and Sakurai, Kazuhiro, 4,561,629, Cl. 251-65.000.
Sakakibara, Kazuo; Shimogawa, Toshiaki; Kato, Masahiko; and Matsuoka, Fumio, 4,561,606, Cl. 242-107.000.
Nippon Steel Corporation: *See*—
Ichikawa, Masashi; Takahashi, Yasuo; and Saito, Tohru, 4,561,561, Cl. 220-270.000.
Tanikawa, Keiichi; Fujii, Masahiro; and Kanno, Hideo, 4,561,911, Cl. 148-18.000.
Nippon Telegraph & Telephone Public Corp.: *See*—
Saito, Takashi, 4,561,789, Cl. 400-120.000.
Tokura, Nobuyuki; Hakamata, Yoshiro; and Oguchi, Kimio, 4,562,582, Cl. 375-87.000.
Nippon Zeon Co., Ltd.: *See*—
Shiozaki, Shozo; Yamada, Hideaki; Tani, Yoshiki; and Shimizu, Sakayu, 4,562,149, Cl. 435-88.000.
Nippondenso Co., Ltd.: *See*—
Kamai, Kenichiro, 4,561,295, Cl. 73-117.300.
Nishi, Yasuyuki; Takagi, Masashi; and Sakurai, Masao, 4,561,260, Cl. 62-115.000.
Nishi, Yasuyuki; Takagi, Masashi; and Sakurai, Masao, to Nippondenso Co., Ltd. Method of controlling refrigeration system for automotive air conditioner. 4,561,260, Cl. 62-115.000.
Nishida, Sumio; Matsuo, Noritada; Tsushima, Kazunori; Hatakoshi, Makoto; and Hirano, Masachika, to Sumitomo Chemical Company, Limited. Certain phenoxy-benzyloxy ether derivatives and an insecticidal and/or acaricidal composition containing the same and methods of use. 4,562,213, Cl. 514-721.000.
Nishida, Takashi: *See*—
Kawano, Tadaaki; and Nishida, Takashi, 4,561,755, Cl. 355-3.0SH.
Kawano, Tadaaki; Ito, Keizo; and Nishida, Takashi, 4,561,760, Cl. 355-3.00R.
Nishide, Kazuhiro: *See*—
Sakakibara, Sakuichi; Tokuda, Yoshiaki; Nagai, Tamio; Mikata, Yoshitaka; and Nishide, Kazuhiro, 4,561,509, Cl. 177-25.000.
Nishihara, Hisakatsu: *See*—
Hiraishi, Hisashi; Nishihara, Hisakatsu; and Shiokawa, Hiroyuki, 4,561,890, Cl. 75-125.000.
Nishikawa, Akio: *See*—
Yamaguchi, Motoo; Sone, Isamu; Hirasawa, Kunio; Yoshioka, Yoshio; Nishikawa, Akio; Suzuki, Hiroshi; Sato, Mikio; and Hosokawa, Masao, 4,562,322, Cl. 200-148.00G.
Nishino, Atsushi; Yoshida, Akihiko; and Tanahashi, Ichiroh, to Matsushita Electric Industrial Co., Ltd. Electric double layer capacitor. 4,562,511, Cl. 361-324.000.
Nishitani, Yoshihisa; Nakano, Masateru; and Yamamoto, Yoshihito, to Mitsubishi Denki Kabushiki Kaisha. Magnetic video recording apparatus for intermittent recording. 4,562,493, Cl. 360-74.100.
Nishizawa, Hiroshi; Ando, Saburo; and Ito, Syuji, to Fujitsu Limited. Main storage configuration control system. 4,562,532, Cl. 364-200.000.
Nishizawa, Jun-ichi, to Nishizawa, Jun-ichi. Semiconductor image sensor. 4,562,474, Cl. 358-213.000.
Nissan Motor Company, Limited: *See*—
Hata, Yoshitaka; and Morita, Tatsuo, 4,561,401, Cl. 123-486.000.
Oaku, Takaaki; Hokazono, Yasuzi; Shiota, Masahiko; and Maki, Yoshihiro, 4,561,889, Cl. 75-125.000.
Ogawa, Naoki, 4,562,111, Cl. 428-289.000.
Sasaki, Michiaki, 4,561,977, Cl. 210-356.000.
Shinjo, Tuneo; Nakamura, Yoshiharu; and Chikaraishi, Takayo, 4,561,690, Cl. 296-155.000.
Sugano, Kazuhiko, 4,561,528, Cl. 192-0.052.
Nisshin Flour Milling Co., Ltd.: *See*—
Kizawa, Rikiichi; and Ishigami, Shinji, 4,562,078, Cl. 426-52.000.
Nitro Nobel A.B.: *See*—
Persson, Per I., 4,561,585, Cl. 228-108.000.
Niwa, Takao; Gono, Takeshi; and Osanai, Akinori, to Toyota Jidosha Kabushiki Kaisha. Apparatus for controlling speed ratios of a continuously variable transmission. 4,561,327, Cl. 74-866.000.
Niyama, Eisuke; and Aizawa, Tatsushi, to Hitachi, Ltd. Method of and apparatus for continuously casting metal strip. 4,561,488, Cl. 164-463.000.
NL Sperry Sun, Inc.: *See*—
Sharp, H. Eugene; and Smither, Miles A., 4,562,559, Cl. 367-82.000.
Noda, Tsutomu: *See*—
Tanaka, Hiromichi; Kimura, Hiroyuki; Noda, Tsutomu; Arai, Takao; Kobayashi, Masaharu; and Inoue, Shigeki, 4,562,549, Cl. 364-486.000.
Noguchi, Isamu. Lantern type electric lamp. 4,562,521, Cl. 362-433.000.
Noguchi, Teruo; and Ohkura, Isao, to Mitsubishi Denki Kabushiki Kaisha. Complementary metal-oxide semiconductor integrated circuit device of master slice type. 4,562,453, Cl. 357-44.000.
Nohmayer, Fritz: *See*—
Keller, Roderich; and Nohmayer, Fritz, 4,562,355, Cl. 250-423.00R.
Nojima, Shoshichi; and Nomura, Hiroaki, to Takeda Chemical Industries, Ltd. 2-Methoxypropyl phosphate derivatives. 4,562,005, Cl. 260-403.000.
Noltemeyer, Friedrich: *See*—
Gwinner, Dietrich; Merkle, Roland; and Noltemeyer, Friedrich, 4,561,388, Cl. 123-41.740.
Nomura, Hiroaki: *See*—
Nojima, Shoshichi; and Nomura, Hiroaki, 4,562,005, Cl. 260-403.000.
Nomura, Yoshisaburo: *See*—
Yamada, Koichi; Mouri, Masahide; and Nomura, Yoshisaburo, 4,562,040, Cl. 419-23.000.
Norchem, Inc. formerly Northern Petrochemical Company: *See*—
Foster, Ronald H., 4,561,920, Cl. 156-244.110.
Nordson Corporation: *See*—
Mulder, Douglas C.; and O'Ryan, David E., 4,561,380, Cl. 118-688.000.
Navarro, Richard R., 4,562,088, Cl. 427-8.000.
Noren, Gerry K.: *See*—
Zimmerman, John M.; Krajewski, John J.; and Noren, Gerry K., 4,562,235, Cl. 526-304.000.
Norizuki, Senichiro: *See*—
Yamamoto, Osamu; and Norizuki, Senichiro, 4,561,182, Cl. 30-433.000.
North American Philips Consumer Electronics Corp.: *See*—
Denton, Jerry N., 4,562,570, Cl. 369-270.000.

North American Philips Corporation: *See*—
Frankfort, Eric J.; Kenney, George C., II; and McFarlane, Robert, 4,562,567, Cl. 369-106.000.
Przepiora, Edward; and Lombardi, Gerald T., 4,561,542, Cl. 206-418.000.
Northern Engineering and Plastics Corp.: *See*—
Crisci, Clem C., 4,561,553, Cl. 215-256.000.
Northern Telecom Limited: *See*—
Calder, Iain D.; and Naguib, Hussein M., 4,561,906, Cl. 148-1.500.
Checkland, John A.; and Woytiuk, Leo V., 4,562,302, Cl. 174-118.000.
Watters, James M.; and Clement, Donald E., 4,562,310, Cl. 179-100.00R.
Norton, Charles J.; Falk, David O.; and Hill, Alfred D., to Marathon Oil Company. Oil recovery process using a polyacrylamide gel. 4,561,502, Cl. 166-274.000.
Norton, Edward J.: *See*—
Graham, Kenneth W.; Norton, Edward J.; and Kurata, Shuhei, 4,561,140, Cl. 12-146.0BR.
Norton, Harry W., to Hatrick Industries Limited. Wheelchair tipping apparatus. 4,561,823, Cl. 414-678.000.
Nottingham, John R.: *See*—
Loechner, John T.; Kruger, Kurt J.; Nottingham, John R.; and Golembek, Joe M., 4,561,416, Cl. 126-21.00A.
Nova/Husky Research Corporation Ltd.: *See*—
Thompson, Bradley G.; and Jack, Thomas R., 4,561,500, Cl. 166-246.000.
Novak, Milan, to Canada, Her Majesty the Queen in Right of, as represented by the Minister of Natural Resources. Pin release for animal trap. 4,561,207, Cl. 43-87.000.
Novotny, Rudolf: *See*—
Hempel, Hans-Ulrich; Novotny, Rudolf; Staller, Siegfried; and Kramer, Johannes, 4,561,873, Cl. 65-27.000.
Nowobilski, Jeffert J.; and Acharya, Arun, to Union Carbide Corporation. Intercooler with three-section baffle. 4,561,498, Cl. 165-160.000.
Nozato, Fujio. Ball throwing machine. 4,561,414, Cl. 124-78.000.
NSK-Warner K. K.: *See*—
Kawai, Osamu, 4,561,677, Cl. 280-804.000.
Nukem GmbH: *See*—
Hrovat, Milan; Huschka, Hans; Rachor, Lothar; and Vollath, Dieter, 4,562,017, Cl. 264-0.500.
Vietzke, Horst; Schlich, Elmar; Luthardt, Gunther; and Huschka, Hans, 4,562,001, Cl. 252-633.000.
Nussdorfer, Theodore J.: *See*—
Sinclair, Ronald R.; and Nussdorfer, Theodore J., 4,561,611, Cl. 244-3.160.
Oaku, Takaaki; Hokazono, Yasuzi; Shiota, Masahiko; and Maki, Yoshihiro, to Nissan Motor Co., Ltd. Wear-resistant sintered ferrous alloy and method of producing same. 4,561,889, Cl. 75-125.000.
Obara, Takashi: *See*—
Sunami, Hideo; Kuguminato, Hideo; Izumiyama, Yoshio; Yanagishima, Fumiya; Obara, Takashi; and Mochizuki, Kazuo, 4,561,909, Cl. 148-12.00D.
O'Brien, John T., to Phillips Petroleum Company. Temperature logging while drilling. 4,561,300, Cl. 73-154.000.
Occidental Chemical Corporation: *See*—
Foster, Arthur M., 4,562,286, Cl. 562-467.000.
Walker, Leigh E.; and Ranade, Gautam R., 4,562,229, Cl. 525-71.000.
Ockert, Carl E.: *See*—
Shin, Yong W.; Wiedermann, Arne H.; and Ockert, Carl E., 4,562,036, Cl. 376-283.000.
Odaka, Kentaro; Sako, Yoichiro; Kojima, Yuichi; Nakano, Kenji; and Moriwaki, Hisayoshi, to Sony Corporation. Method for data transmission. 4,562,578, Cl. 371-40.000.
Odom, Robert E., to Bemis Company, Inc. Bag filling and closing apparatus. 4,561,238, Cl. 53-573.000.
Oettgen, Herbert F.: *See*—
Real, Francisco X.; Mattes, M. Jules; Houghton, Alan N.; Livingston, Philip O.; Lloyd, Kenneth O.; Oettgen, Herbert F.; and Old, Lloyd J., 4,562,160, Cl. 436-539.000.
Officine Gaudino di P. Gaudino & C.S. a.s.: *See*—
Gaudino, Piero, 4,561,243, Cl. 57-274.000.
Ofusa, Masaatsu, to Yoshida Kogyo K.K. Woven slide fastener stringers. 4,561,474, Cl. 139-384.00B.
Ogasawara, Terumi; Arai, Masayuki; and Shikano, Tohru, to Asahi Seimitsu Kabushiki Kaisha. Automatic diaphragm control device for use with CCTV camera. 4,562,477, Cl. 358-228.000.
Ogasawara, Terumi: *See*—
Shikano, Tohru; Ogasawara, Terumi; and Arai, Masayuki, 4,562,476, Cl. 358-228.000.
Ogata, Hajime: *See*—
Mochizuki, Kazuo; Nakakoji, Hisatada; Ichida, Toshio; Irie, Toshio; Ogata, Hajime; and Yamaji, Kyoko, 4,561,943, Cl. 204-28.000.
Ogawa, Kazuyoshi: *See*—
Takagi, Katsuaki; Kita, Yuzo; Hagiwara, Yoshimune; Torii, Shuichi; and Ogawa, Kazuyoshi, 4,562,424, Cl. 340-347.0NT.
Ogawa, Naoki, to Nissan Motor Co., Ltd. Various-covers and method for producing same. 4,562,111, Cl. 428-289.000.
Ogawa, Yozo: *See*—
Kato, Toshiyuki; Takahashi, Isao; Irie, Toshio; and Ogawa, Yozo, 4,561,910, Cl. 148-12.400.
Ogihara, Satoru: *See*—
Maeda, Kunihiro; Usami Katsuhisa; Takeda, Yukio; Ogihara, Satoru; and Asai, Osamu, 4,561,891, Cl. 75-238.000.
Ogiso, Osamu: *See*—
Yamamoto, Hisao; Kimura, Fumihiko; and Ogiso, Osamu, 4,561,987, Cl. 252-8.900.
Ograd s.r.l.: *See*—
Grati, Giorgio, 4,561,706, Cl. 312-258.000.
Oguchi, Kimio: *See*—
Tokura, Nobuyuki; Hakamata, Yoshiro; and Oguchi, Kimio, 4,562,582, Cl. 375-87.000.
O'Gwynn, David C.; and Helmers, Thomas L., to Ampex Corporation. Adaptive end of tape detection apparatus and method. 4,561,608, Cl. 242-186.000.
Ohashi, Naohito; Nagata, Shoji; and Ishizumi, Kikuo, to Sumitomo Chemical Company, Limited. Process for producing 3-(3,4-dihydroxyphenyl) serine. 4,562,263, Cl. 548-479.000.
Ohio State University Research Foundation, The: *See*—
Horton, Derek; and Priebe, Waldemar A., 4,562,177, Cl. 514-34.000.
Ohkura, Isao: *See*—
Noguchi, Teruo; and Ohkura, Isao, 4,562,453, Cl. 357-44.000.
Ohmae, Kenichi; Tateisi, Kazuma; Shinohara, Yoshitsugu; and Ichihashi, Masazumi, to Omron Tateisi Electronics Co. Electronic cash register. 4,562,341, Cl. 235-379.000.
Ohno, Hiroko, to Casio Computer Co., Ltd. Automatic accompaniment apparatus. 4,561,338, Cl. 84-1.030.
Ohno, John M., to General Electric Company. Bi-level cutting insert. 4,561,810, Cl. 407-118.000.
Ohno, Yoshimi; and Tsurukawa, Ikuya, to Ricoh Company, Ltd. Autofocusing method. 4,561,747, Cl. 354-402.000.
Ohshiro, Toshio: *See*—
Kubo, Kiyoshi; and Ohshiro, Toshio, 4,561,440, Cl. 128-395.000.
Ohtake, Matsuo: *See*—
Harada, Shooichi; and Ohtake, Matsuo, 4,561,219, Cl. 51-319.000.
Ohtsuka, Shuichi: *See*—
Okano, Takeshi; and Ohtsuka, Shuichi, 4,561,769, Cl. 355-45.000.
Ohtsuki, Osamu: *See*—
Tanikawa, Kunihiro; and Ohtsuki, Osamu, 4,562,452, Cl. 357-24.000.
Ohtsuki, Tadashi: *See*—
Tanaka, Masato; Ohtsuki, Tadashi; and Tsuchiya, Yoshikazu, 4,562,581, Cl. 375-7.000.
Ohura, Hitoshi: *See*—
Kitabayashi, Yukio; Takahashi, Noriyoshi; Okuyama, Toshiaki; Watanabe, Masatoshi; and Ohura, Hitoshi, 4,562,397, Cl. 318-814.000.
Oinoue, Kenichi: *See*—
Aoki, Masahiro; Nakamura, Junichi; Ida, Masatoshi; Oinoue, Kenichi; and Hayashi, Asao, 4,562,345, Cl. 250-201.000.
Hayashi, Asao; Oinoue, Kenichi; Aoki, Masahiro; and Ida, Masatoshi, 4,562,346, Cl. 250-201.000.
Oka, Tateki, to Minolta Camera Kabushiki Kaisha. Method of forming composite images. 4,562,130, Cl. 430-54.000.
Okabe, Nobuya; and Nakagiri, Fumiki, to Hitachi, Ltd. Hydraulic drive system for civil engineering and construction machinery. 4,561,824, Cl. 414-697.000.
Okada, Yoshio; and Igarashi, Yuriko, to Kureha Kagaku Kogyo Kabushiki Kaisha. Microcapsule for pressure-sensitive recording paper and process for producing the same. 4,562,116, Cl. 428-402.210.
Okamato, Takeshi: *See*—
Asai, Ryuichi; Okamato, Takeshi; and Minagawa, Shoichi, 4,562,371, Cl. 310-313.00A.
Okami, Seiichi, to Osaka Titanium Co., Ltd. Heating power supply apparatus for polycrystalline semiconductor rods. 4,562,338, Cl. 219-503.000.
Okamoto, Kazuhiko; and Chaki, Takao, to Clarion Co., Ltd. Arm mechanism for a pushbutton type tuner. 4,561,317, Cl. 74-10.330.
Okamura, Naomi: *See*—
Okuno, Eiichi; Okamura, Naomi; and Saitoh, Takashi, 4,562,237, Cl. 528-17.000.
Okano, Takeshi; and Ohtsuka, Shuichi, to Fuji Photo Film Co., Ltd. Combined camera and viewer. 4,561,769, Cl. 355-45.000.
Okazaki, Sakiho, to Kabushiki Kaisha Suwa Seikosha. Trial spectacles. 4,561,739, Cl. 351-227.000.
Okazaki, Yuichi: *See*—
Kohno, Tsuguo; Yoshida, Yoshitaro; Tenjinbayashi, Koji; and Okazaki, Yuichi, 4,561,333, Cl. 82-1.00C.
O'Keeffe, Michael J.: *See*—
Glover, Neal; O'Keeffe, Michael J.; and Perera, S. Robert, 4,562,577, Cl. 371-38.000.
Okey, David W.: *See*—
Lee, Raymond; Ferro, Gregory A.; and Okey, David W., 4,562,112, Cl. 428-318.600.
Oku, Teruo: *See*—
Teraji, Tsutomu; Todo, Eishiro; Shimazaki, Norihiko; Oku, Teruo; and Namiki, Takayuki, 4,562,179, Cl. 514-77.000.
Okubo, Naofumi: *See*—
Saito, Toshiyuki; Okubo, Naofumi; and Kaneko, Yoshiaki, 4,562,409, Cl. 330-286.000.
Okuda, Naoki; Yamada, Minoru; and Yoshino, Fumito, to Kabushiki Kaisha Kobe Seiko Sho. Welding wire for use in submerged arc welding of Cr-Mo steels. 4,561,888, Cl. 75-124.000.
Okumura, Katsuya; and Miyoshi, Motosuke, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor element. 4,562,455, Cl. 357-71.000.
Okuno, Eiichi; Okamura, Naomi; and Saitoh, Takashi, to Cemedine Co., Ltd. One component room temperature curable sealant composition. 4,562,237, Cl. 528-17.000.

Okuyama, Toshiaki: *See*—
Kitabayashi, Yukio; Takahashi, Noriyoshi; Okuyama, Toshiaki; Watanabe, Masatoshi; and Ohura, Hitoshi, 4,562,397, Cl. 318-814.000.
Old, Lloyd J.: *See*—
Real, Francisco X.; Mattes, M. Jules; Houghton, Alan N.; Livingston, Philip O.; Lloyd, Kenneth O.; Oettgen, Herbert F.; and Old, Lloyd J., 4,562,160, Cl. 436-539.000.
O'Leary, Raymond P.: *See*—
Hall, Walter J.; and O'Leary, Raymond P., 4,562,324, Cl. 200-260.000.
Olikara, Philip; and Binge, Derek S., to RCA Corporation. Deployable folded multi-element satellite subsystems. 4,561,614, Cl. 244-173.000.
Olin Corporation: *See*—
Dantzig, Jonathan A.; and Patton, John V., 4,561,489, Cl. 164-467.000.
Dory, Thomas S., 4,561,862, Cl. 44-57.000.
Miles, Ronald C.; and Justice, David D., 4,561,949, Cl. 204-147.000.
Olsen, James E.: *See*—
Brownbill, George A.; and Olsen, James E., 4,561,463, Cl. 137-596.130.
Olsen, Roy W.; and Bell, Curtis H., to Goodyear Tire & Rubber Company, The. Apparatus for making a hose having an index mark. 4,561,838, Cl. 425-387.100.
Olympus Optical Company Limited: *See*—
Hayashi, Asao; Oinoue, Kenichi; Aoki, Masahiro; and Ida, Masatoshi, 4,562,346, Cl. 250-201.000.
Konomura, Yutaka, 4,561,428, Cl. 128-4.000.
Mihara, Shin-ichi; Imai, Toshihiro; Nakahashi, Ken-ichi; Iba, Youichi; Imaizumi, Masaki; and Taira, Akio, 4,562,344, Cl. 250-201.000.
Sato, Ken; Takahashi, Yutaka; Tsukaya, Takashi; Kato, Shinichi; and Hattori, Shinichiro, 4,561,429, Cl. 128-6.000.
Omaki, Takanobu; Nakamura, Akiyoshi; Ishida, Masato; and Matsushita, Shuzo, to Minolta Camera Kabushiki Kaisha. Focus detection device. 4,561,748, Cl. 354-403.000.
Omark Industries, Inc.: *See*—
Weisgerber, David J., 4,561,181, Cl. 30-387.000.
Omori, Yoshitaka, to Honda Giken Kogyo Kabushiki Kaisha. Rear suspension for a motorcycle. 4,561,519, Cl. 180-227.000.
Omron Tateisi Electronics Co.: *See*—
Ohmae, Kenichi; Tateisi, Kazuma; Shinohara, Yoshitsugu; and Ichihashi, Masazumi, 4,562,341, Cl. 235-379.000.
Tateisi, Kazuma; and Shinohara, Yoshitsugu, 4,562,340, Cl. 235-379.000.
Onder, Kemal: *See*—
Chen, Augustin T.; Onder, Kemal; and Rausch, Karl W., Jr., 4,562,228, Cl. 525-66.000.
Ong, Beng S.; Keoshkerian, Barkev; Murti, Dasarao K.; and Mammino, Joseph, to Xerox Corporation. Photoresponsive imaging members containing electron transport overcoatings. 4,562,132, Cl. 430-59.000.
Ono Pharmaceutical Co., Ltd.: *See*—
Imaki, Katsuhiro; Muryobayashi, Takashi; and Kawasaki, Akiyoshi, 4,562,207, Cl. 514-573.000.
Wakatsuka, Hirohisa; Yamato, Takashi; and Hashimoto, Shinsuke, 4,562,204, Cl. 514-530.000.
Ono, Satoshi: *See*—
Hiramitsu, Tetsushi; Sugita, Hiroshi; Ono, Satoshi; and Murase, Zenzaburo, 4,561,324, Cl. 74-498.000.
Onoda, Kenji; and Kawasima, Yukio, to Mizuno Corporation. Midsole assembly for an athletic shoe. 4,561,195, Cl. 36-30.00R.
Onodera, Kaoru: *See*—
Uemura, Morito; and Onodera, Kaoru, 4,562,138, Cl. 430-219.000.
Ontek, Louis. Liquid sampling apparatus and method of manufacture therefor. 4,561,315, Cl. 73-864.640.
Onuki, Akio: *See*—
Fujioka, Yoshiharu; Onuki, Akio; and Takei, Shushi, 4,562,503, Cl. 360-123.000.
Ooe, Akihiko; and Fuse, Masaki, to Mitsubishi Rayon Co., Ltd. Method for determination of percentage T cell content of lymphocyte. 4,562,593, Cl. 382-6.000.
Opladen, Gunter: *See*—
Keller, Manfred; and Opladen, Gunter, 4,562,354, Cl. 250-388.000.
Orbital Engine Company Proprietary Limited: *See*—
Simons, Peter W., 4,561,405, Cl. 123-531.000.
Orlando, Franklin P.; Goulart, Joseph S.; and Chandra, Rangasami S., to FMC Corporation. Apparatus for detecting changes in inclination or acceleration. 4,561,299, Cl. 73-151.000.
O'Rourke, David P., to RCA Corporation. Phase lock loop prepositioning apparatus with feedback control. 4,562,410, Cl. 331-1.00A.
O'Rourke, David P.; and Yeager, Richard O., to RCA Corporation. Prepositioning circuit for phase lock loop. 4,562,411, Cl. 331-1.00A.
Orova, Josef: *See*—
Buchschmid, Emil; Gademann, Lothar; Hirt, Adam; Huttinger, Manfred; Jahn, Hans P.; Orova, Josef; Schmid, Hans-Dieter; and Steffen, Horst-Gunter, 4,561,410, Cl. 123-599.000.
Ortner Freight Car Company: *See*—
Adams, Norman S., 4,561,361, Cl. 105-406.00R.
O'Ryan, David E.: *See*—
Mulder, Douglas C.; and O'Ryan, David E., 4,561,380, Cl. 118-688.000.
Osaka Kongo Seito Co.: *See*—
Hashimoto, Masahiro; and Tani, Hideo, 4,561,863, Cl. 51-295.000.
Osaka Titanium Co., Ltd.: *See*—
Okami, Seiichi, 4,562,338, Cl. 219-503.000.
Osanai, Akinori: *See*—
Niwa, Takao; Gono, Takeshi; and Osanai, Akinori, 4,561,327, Cl. 74-866.000.
Oshiyama, Tsutomu: *See*—
Miyazaki, Haruo; Yamasaki, Yasuaki; and Oshiyama, Tsutomu, 4,562,164, Cl. 501-151.000.
Ossler, Walter: *See*—
Kopetzky, Horst; Nagler, Werner; and Ossler, Walter, 4,562,308, Cl. 179-18.0FA.
Ostrander, William J., to Chevron Research Company. Method for interpretation of seismic records to yield indicating of the lithology of gas-bearing and capping strata. 4,562,558, Cl. 367-68.000.
Oswald, Hendrikus J.: *See*—
Li, Hsin L.; and Oswald, Hendrikus J., 4,562,022, Cl. 264-54.000.
Otaki, Toshihiro; Nagata, Ryuichi; and Yoshii, Toshiya, to Toray Industries, Inc. Liquid crystal display cell with improved plastic substrates. 4,561,724, Cl. 350-334.000.
Ott, William E., to Allied Corporation. Automatic slack adjuster. 4,561,523, Cl. 188-79.50K.
Otto, Jack F.: *See*—
Colacello, Michael A.; Fitzke, Emil V.; and Otto, Jack F., 4,561,874, Cl. 65-36.000.
Ouchi, Yoshiaki; Ishihara, Masamichi; Matsumoto, Tetsuro; and Miyazawa, Kazuyuki, to Hitachi, Ltd.; and Hitachi Microcomputer Engineering Ltd. Semiconductor memory device. 4,562,555, Cl. 365-233.000.
Oushiden, Hideshi: *See*—
Nawata, Yoshiaki; and Oushiden, Hideshi, 4,561,758, Cl. 355-8.000.
Outokumpu Oy: *See*—
Heimala, Seppo O.; and Saari, Kaarlo M. J., 4,561,970, Cl. 209-3.000.
Makipirtti, Simo A. I.; and Setala, Pekka T., 4,561,884, Cl. 75-21.000.
Overseas Promotions Ltd.: *See*—
Benson, Lee, 4,561,743, Cl. 354-121.000.
Ovren, Christer: *See*—
Brogardh, Torgny; Hok, Bertil; and Ovren, Christer, 4,562,348, Cl. 250-231.00R.
Owen, Daniel V., to General Electric Company. Variable reactance inductor with adjustable ranges. 4,562,384, Cl. 315-276.000.
Owen, Hartley; Haddad, James H.; and Zahner, John C., to Mobil Oil Corporation. Combination fluid bed dry distillation and coking process for oil/tar sands. 4,561,966, Cl. 208-11.00R.
Owen, Jeffrey D.; and Brown, Harold M., to Zinetics Medical Technology Corporation. Antimony and graphite hydrogen ion electrode and method of making such electrode. 4,561,963, Cl. 204-433.000.
Owens-Corning Fiberglas Corporation: *See*—
Bhatti, Mohinder S., 4,561,870, Cl. 65-1.000.
Pugnale, Peter J.; Clark, John M.; and Penland, William R., 4,561,292, Cl. 73-49.200.
Oy Euramechano AB: *See*—
Sohlstrom, Lasse, 4,561,209, Cl. 49-246.000.
Oy Fiskars AB: *See*—
Call, Daniel D., 4,561,548, Cl. 211-70.700.
Oy Tampella AB: *See*—
Rimpi, Pertti K., 4,561,934, Cl. 162-30.100.
Oyama, Yoshishige; Fujieda, Mamoru; and Yamauchi, Teruo, to Hitachi, Ltd. Air-fuel ratio control apparatus for internal combustion engines. 4,561,403, Cl. 123-489.000.
Ozaki, Fumikazu: *See*—
Kuriyama, Yasuhisa; Kajiwara, Syoichiro; and Ozaki, Fumikazu, 4,561,982, Cl. 210-698.000.
Pabst, Horst; and Brinkmann, Hans, to Dynamit Nobel Aktiengesellschaft. Process and apparatus for producing a synthetic resin sheet having a colored band of varying color intensity. 4,562,023, Cl. 264-75.000.
Pajak, Witold, to Conair Corporation. Pivoted handle hair curler having self-adjusting clamp. 4,561,455, Cl. 132-37.00R.
Pak, Jungho; and Navia, Jaime A., to Tektronix, Inc. Mounting apparatus for dynamic convergence coils. 4,562,480, Cl. 358-248.000.
Palacio, Joaquin J.: *See*—
Rionda, Carlos S.; and Palacio, Joaquin J., 4,561,230, Cl. 52-289.000.
Palazzolo, James C. Electrolytic silver recovery system. 4,561,957, Cl. 204-237.000.
Pall Corporation: *See*—
Koehler, Paul C., 4,562,039, Cl. 419-2.000.
Panayotou, Nicholas F.; Green, Donald R.; and Price, Larry S., to United States of America, Energy. Furnace assembly. 4,562,037, Cl. 376-340.000.
Pankin, Sidney M., to Maximum Technology. Reflector systems for lighting fixtures and method of installation. 4,562,517, Cl. 362-147.000.
Panuska, Brian R., to Sperry Corporation. Biased harmonic locking ring. 4,561,795, Cl. 403-4.000.
Pardini, Ronald S.: *See*—
Parkhurst, Robert M.; and Pardini, Ronald S., 4,562,298, Cl. 568-644.000.
Pardue, Jerry E.: *See*—
Shaw, James E.; and Pardue, Jerry E., 4,561,501, Cl. 166-273.000.
Parekh, Bhupendra: *See*—
Muralidhara, Harapanahalli; Parekh, Bhupendra; and Senapati, Nagabhusan, 4,561,953, Cl. 204-182.300.
Parisel, Christian A. F.: *See*—
Bezard, Jean-Yves L. N.; Brocard, Jean-Marie; and Parisel, Christian A. F., 4,561,470, Cl. 137-625.610.

Park, In P.: *See—*
Park, Sea C.; and Park, In P., 4,561,557, Cl. 220-90.200.
Park, Sea C.; and Park, In P. Beverage container with a sanitary drinking spout. 4,561,557, Cl. 220-90.200.
Parkhurst, Robert M.; and Pardini, Ronald S., to Chemex Pharmaceuticals, Inc. Optically active nordihydroguaiaretic acid and intermediates. 4,562,298, Cl. 568-644.000.
Parkinson, Martin C. Method and apparatus for continuous freeze drying. 4,561,191, Cl. 34-5.000.
Parks, Thomas W.; and Morris, Charles F., Jr., to Schlumberger Technology Corporation. Method and apparatus for determining acoustic wave parameters from acoustic well logging waveforms. 4,562,557, Cl. 367-27.000.
Parlman, Robert M.: *See—*
Bresson, Clarence R.; Parlman, Robert M.; and Kimble, James B., 4,561,984, Cl. 252-61.000.
Parque, John P. Portable vacuum holding device. 4,561,642, Cl. 269-21.000.
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Turner, Laurence F.; Bailey, John W.; and Parrish, Henry H., 4,562,425, Cl. 340-347.0DD.
Parsons, David; Windsor, Harry M.; and Comfort, John V., to Automotive Products plc. Electronic clutch control system. 4,561,530, Cl. 192-0.076.
Parsons, David: *See—*
Young, Alastair J.; Arrowsmith, David R.; and Parsons, David, 4,561,531, Cl. 192-85.0CA.
Pascal, Roger; and Bressand, Rene, to Salomon S.A. Safety ski binding. 4,561,673, Cl. 280-629.000.
Pastor, Marc: *See—*
Dinh, Chom T. L.; Garceau, Roger; Pastor, Marc; and Terreault, Gerard, 4,562,470, Cl. 358-167.000.
Patel, Jayantilal S.: *See—*
Goodby, John W.; Leslie, Thomas M.; and Patel, Jayantilal S., 4,561,726, Cl. 350-341.000.
Patel, Mansukh M.: *See—*
Arnold, Todd W.; and Patel, Mansukh M., 4,562,076, Cl. 426-5.000.
Patrick, Thomas R.; Powell, Richard; and Berdanier, Barry N., to Texas Instruments Incorporated. Thermally integrated laser/FLIR rangefinder. 4,561,775, Cl. 356-5.000.
Patten, Malcolm J.: *See—*
Wilkinson, Maxwell; Patten, Malcolm J.; and Lee, Jeffrey H., 4,561,267, Cl. 66-178.00A.
Patton, John V.: *See—*
Dantzig, Jonathan A.; and Patton, John V., 4,561,489, Cl. 164-467.000.
Paulus, Wilfried: *See—*
Kuhle, Engelbert; Paulus, Wilfried; Genth, Hermann; Brandes, Wilhelm; and Reinecke, Paul, 4,562,208, Cl. 514-593.000.
Pavelic, Vjekoslav; and Tews, Paul, to Wisconsin Alumni Research Foundation. Submerged arc welding flux. 4,561,914, Cl. 148-26.000.
Paxton, Harold G. Tow apparatus and method of installation. 4,561,375, Cl. 114-253.000.
Pearson, Bernard A.: *See—*
Snellman, Donald L.; Kingsley, Michael L.; and Pearson, Bernard A., 4,561,647, Cl. 271-296.000.
Peerman, Dwight E.; and Frisch, Kurt C., to Henkel Corporation. Polyurethane adhesives with improved water resistance containing a hydroxymethyl fatty polyol. 4,561,922, Cl. 156-331.400.
Pekarich, Steven P.: *See—*
Berenbaum, Alan D.; Jagannathan, Anand; Molinelli, John J.; and Pekarich, Steven P., 4,562,538, Cl. 364-200.000.
Pellolio, Anselmo P.: *See—*
Brockway, Brock F.; Moretti, Anthony L.; Pellolio, Anselmo P.; and Rasmussen, Jimmie, 4,561,162, Cl. 29-428.000.
Pelster, Heinrich: *See—*
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Pelzer, Jozef B.: *See—*
Gerkema, Jan; Niessen, Anton K.; and Pelzer, Jozef B., 4,562,587, Cl. 378-133.000.
Pemco-Kalamazoo, Inc.: *See—*
Black, John W., 4,561,626, Cl. 249-118.000.
Pencept, Inc.: *See—*
Ward, Jean R.; and Nilssen, Andrew H., 4,562,304, Cl. 178-18.000.
Penland, William R.: *See—*
Pugnale, Peter J.; Clark, John M.; and Penland, William R., 4,561,292, Cl. 73-49.200.
Peralta, Eduardo J.; and Reitz, Kay M., to Ford Aerospace & Communications Corporation. Imaging radar seeker. 4,562,439, Cl. 343-17.10R.
Percec, Virgil, to B. F. Goodrich Company, The. Crosslinkable difunctionalized polyarylene polyethers. 4,562,243, Cl. 528-174.000.
Perera, S. Robert: *See—*
Glover, Neal; O'Keeffe, Michael J.; and Perera, S. Robert, 4,562,577, Cl. 371-38.000.
Performance Controls Company: *See—*
Goff, Jerry K.; Marinko, Joseph A., Jr.; Venditto, Joseph G., Jr.; and Yost, Donald A., 4,562,386, Cl. 318-254.000.
Perkins, Haywood A.: *See—*
Moles, Oliver W.; Ensley, Kenneth L.; and Perkins, Haywood A., 4,562,048, Cl. 423-81.000.
Perrotti, Emilio: *See—*
Neri, Carlo; Giroldini, Villiam; Traversoni, Mario; Guizzi, Guido; Perrotti, Emilio; and Rinaldi, Antonio, 4,562,266, Cl. 549-462.000.
Persson, Per I., to Nitro Nobel A.B. Method of splicing metal elements by means of explosion-welding. 4,561,585, Cl. 228-108.000.
Pesch, Wolfgang: *See—*
Fehr, Hans; Pesch, Wolfgang; and Friedemann, Wolfgang, 4,561,898, Cl. 106-74.000.
Peter, Bernhard: *See—*
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Petersen, Allan E.: *See—*
Shirts, Monte B.; Martin, Dale A.; and Petersen, Allan E., 4,562,049, Cl. 423-82.000.
Petersen, Hans P. B.: *See—*
Blohm, Knud; and Petersen, Hans P. B., 4,561,345, Cl. 91-459.000.
Peterson, Amy L. Math matching game. 4,561,658, Cl. 273-243.000.
Petrie, Brian C.: *See—*
Mels, Sherman J.; Petrie, Brian C.; and Pokusa, Richard J., 4,561,952, Cl. 204-181.700.
Petrini, Roland; and De Marchi, Jean-Louis, to Salomon S.A. Ski boot having upper with journalled distribution plate. 4,561,196, Cl. 36-118.000.
Petrocine, David V., to American Cyanamid Company. Preparation of substituted and unsubstituted 2-carbamoyl nicotinic and 3-quinolinecarboxylic acids. 4,562,257, Cl. 546-169.000.
Petsche, Irena B.: *See—*
Hagerty, Robert O.; Petsche, Irena B.; and Schurzky, Kenneth G., 4,562,169, Cl. 502-107.000.
Pettersen, Arild: *See—*
Wiik, Tore H.; Pettersen, Arild; and Tonnesson, Thorstein, 4,562,343, Cl. 235-382.500.
Pews, R. Garth: *See—*
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Pfizer Inc.: *See—*
Schnur, Rodney C., 4,562,267, Cl. 549-58.000.
Snarey, Michael; Swift, Peter J.; and Witty, Michael J., 4,562,197, Cl. 514-343.000.
Philip Morris Incorporated: *See—*
Edwards, William B., III; and Houminer, Yoram, 4,561,451, Cl. 131-278.000.
Phillips, Brian K.: *See—*
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Phillips Petroleum Company: *See—*
Bertus, Brent J.; and McKay, Dwight L., 4,562,167, Cl. 502-100.000.
Bresson, Clarence R.; Parlman, Robert M.; and Kimble, James B., 4,561,984, Cl. 252-61.000.
Graves, Charles W., 4,561,696, Cl. 299-4.000.
Hays, George E.; Nielsen, Richard H.; Bowen, Chester O.; and Holland, Floyd H., 4,562,046, Cl. 422-140.000.
Kimble, Kenneth B.; and Bresson, Clarence R., 4,561,971, Cl. 209-166.000.
LaFoy, Carl J., 4,562,300, Cl. 585-854.000.
Lee, Clifford C., 4,562,168, Cl. 502-107.000.
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Shaw, James E.; and Pardue, Jerry E., 4,561,501, Cl. 166-273.000.
Phillips, Royston J.: *See—*
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Piascinski, Joseph J.: *See—*
Axelrod, Randolph H.; and Piascinski, Joseph J., 4,562,120, Cl. 428-469.000.
Piazza, Pietro: *See—*
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Pidcock, Anthony: *See—*
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Piecha, Gerhard: *See—*
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Pimlott, John R., to Dow Chemical Company, The. Flat-plate electrolytic cell. 4,561,959, Cl. 204-253.000.
Pioneer Electronic Corporation: *See—*
Tamura, Kunio, 4,562,565, Cl. 369-44.000.
Pitney Bowes Inc.: *See—*
Tramposch, Herbert, 4,561,512, Cl. 177-229.000.
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Pittinger, Charles B., Jr.: *See—*
Pittinger, Charles B., Sr.; Pittinger, Cynthia A.; and Pittinger, Charles B., Jr., 4,561,180, Cl. 30-276.000.
Pittinger, Charles B., Sr.; Pittinger, Cynthia A.; and Pittinger, Charles B., Jr. Apparatus for cutting vegetation with incremental feeding of cutting filament. 4,561,180, Cl. 30-276.000.
Pittinger, Cynthia A.: *See—*
Pittinger, Charles B., Sr.; Pittinger, Cynthia A.; and Pittinger, Charles B., Jr., 4,561,180, Cl. 30-276.000.
Pittz, Eugene P.: *See—*
Smerbeck, Richard V.; and Pittz, Eugene P., 4,562,194, Cl. 514-264.000.
Pitzer, Dorman C.; and Rice, Edward J., to Siliconix Incorporated. Method of making shadow isolated metal DMOS FET device. 4,561,168, Cl. 29-571.000.
Plaige, Yves, to Commissariat a l'Energie Atomique; Framatome; and Merlin-Gerin. Logic safety system. 4,562,035, Cl. 376-215.000.

Platt, Stephen A., to S. A. Platt, Inc. Coiling machine. 4,561,278, Cl. 72-142.000.

Platz, Rolf: *See—*
Rieber, Norbert; Bohm, Heinrich; Platz, Rolf; and Fuchs, Werner, 4,562,262, Cl. 548-257.000.

Pleion Corporation: *See—*
Gartung, Clifford W., 4,561,229, Cl. 52-239.000.

Plevey, Raymond G.: *See—*
Tatlow, John C.; Plevey, Raymond G.; Wotton, David E. M.; and Sargent, Colin R., 4,562,183, Cl. 514-214.000.

Plotnick, Michael A.: *See—*
Hurst, Robert N., Jr.; and Plotnick, Michael A., 4,562,487, Cl. 358-342.000.

Plummer, William T.; and Baker, Philip G., to Polaroid Corporation. Selective photoresponsive sensing circuit. 4,561,753, Cl. 354-432.000.

Pneumatic Rubber Stamp Co., Ltd.: *See—*
Chapman, Richard H.; and Sams, Bernard, 4,561,353, Cl. 101-111.000.

Pocivalnik, Stane: *See—*
Skerjanec, Joze; and Pocivalnik, Stane, 4,561,925, Cl. 156-379.600.

Pokusa, Richard J.: *See—*
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Poland, Sid: *See—*
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Polaroid Corporation: *See—*
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Kinsman, Gordon F.; Lambert, Ronald F.; and Morrison, David A., 4,561,745, Cl. 354-299.000.
Plummer, William T.; and Baker, Philip G., 4,561,753, Cl. 354-432.000.
Stella, Joseph A.; and Wright, Joseph B., 4,561,742, Cl. 354-86.000.

Polizzotto, Joseph F., to Denar Corporation. Dental pantograph. 4,561,846, Cl. 433-73.000.

Pollich, Gerhard, to Heidelberger Druckmaschinen Aktiengesellschaft. Device in the delivery of sheet-fed rotary printing machine for inhibiting curl formation in the leading edge of delivered sheet. 4,561,645, Cl. 271-195.000.

Pond, John B. Volume measurement system. 4,561,298, Cl. 73-149.000.

Ponticello, Gerald S.: *See—*
Baldwin, John J.; and Ponticello, Gerald S., 4,562,184, Cl. 514-222.000.

Porat, Reuven; and Nessel, Eliezer, to Iscar Ltd. Cutting tool insert with chip breaker. 4,561,809, Cl. 407-114.000.

Portzer, Jeffrey W.: *See—*
McDaniel, Roger L., Jr.; Portzer, Jeffrey W.; and Zaiko, Edward J., 4,562,260, Cl. 548-141.000.

Pospischil, Reginhard, to Siemens Aktiengesellschaft. CMI Decoder. 4,562,422, Cl. 340-347.0DD.

Poss Design Limited: *See—*
Poss, Werner, 4,561,834, Cl. 418-150.000.

Poss, Werner, to Poss Design Limited. Rotary vaned pumps with fixed length and shearing knife-edged vanes. 4,561,834, Cl. 418-150.000.

Potage, Jean: *See—*
Deman, Pierre; and Potage, Jean, 4,562,571, Cl. 370-7.000.

Pothier, Robert G., to Sanders Associates, Inc. Antenna coupler with ribbon gasket. 4,562,440, Cl. 343-703.000.

Potts, David M.: *See—*
Wheeler, Robert G.; and Potts, David M., 4,561,433, Cl. 128-130.000.

Powell, Richard: *See—*
Patrick, Thomas R.; Powell, Richard; and Berdanier, Barry N., 4,561,775, Cl. 356-5.000.

Powell, Robert F. Vehicle frame alignment gauge. 4,561,187, Cl. 33-288.000.

Power Shaft Engine: *See—*
Molignoni, Albert J., 4,561,256, Cl. 60-692.000.

Power Technology Partners, Ltd.: *See—*
Freeny, Charles C., Jr.; and Rabin, Ronald J., 4,561,848, Cl. 434-18.000.

Prager, Bernhard C.; Punk, Peter; and Thaler, Heinrich, to Biochemie Gesellschaft m.b.H. Deacylation of amides. 4,562,253, Cl. 544-19.000.

Pratt, Russell W., Sr. Wheel rim wrench. 4,561,331, Cl. 81-464.000.

Precision Metal Fabricators, Inc.: *See—*
Lenhart, Ronald A., 4,561,806, Cl. 406-88.000.

Precitronic Gesellschaft fur Feinmechanik und Electronic mbH: *See—*
Eichweber, Kurt, 4,561,849, Cl. 434-22.000.

Preis, Hans M.: *See—*
Heimburger, Norbert; Kumpe, Gerhardt; Wormsbacher, Wilfried; and Preis, Hans M., 4,562,072, Cl. 424-101.000.

Prestia, Joseph: *See—*
Haza, Robert R., 4,561,654, Cl. 273-63.00B.

Preuss, Bernhard; and Manthe, Karl-Heinz, to Siemens Aktiengesellschaft. Electrodynamically opening contact system. 4,562,419, Cl. 335-195.000.

Prevot, Claude: *See—*
Bernard, Jacques; Rovel, Jean-Marie; Nicol, Roger; and Prevot, Claude, 4,561,974, Cl. 210-151.000.

Price, Larry S.: *See—*
Panayotou, Nicholas F.; Green, Donald R.; and Price, Larry S., 4,562,037, Cl. 376-340.000.

Priebe, Waldemar A.: *See—*
Horton, Derek; and Priebe, Waldemar A., 4,562,177, Cl. 514-34.000.

Prime Computer, Inc.: *See—*
Robillard, David R.; Bullock, Robert J.; and Marino, Jerry C., 4,561,619, Cl. 248-285.000.

Prime, Ronald M.: *See—*
Weaver, Richard A.; Niedzielski, James H.; and Prime, Ronald M., 4,561,536, Cl. 198-481.100.

Prime & Weaver Investment Company: *See—*
Weaver, Richard A.; Niedzielski, James H.; and Prime, Ronald M., 4,561,536, Cl. 198-481.100.

Pro. Bio. Spe. S.r.l.: *See—*
Arpesella, Marco, 4,561,129, Cl. 623-2.000.

Procter & Gamble Company, The: *See—*
Herbots, Ivan; Johnston, James P.; and Walker, John R., 4,561,991, Cl. 252-118.000.
Wertz, Jean-Luc H. M.; and Goffinet, Pierre C. E., 4,561,998, Cl. 252-547.000.

Proficient Systems, Inc.: *See—*
Moore, Joseph L.; Moore, R. Keith; and Moore, Dennis K., 4,561,240, Cl. 56-328.00R.

Programasyst Limited: *See—*
Drummond, Andrew F., 4,562,529, Cl. 364-140.000.

Pryor, Timothy R., to Diffracto Ltd. Electro-optical sensors for tool and robotic inspection. 4,561,776, Cl. 356-72.000.

Przepiora, Edward; and Lombardi, Gerald T., to North American Philips Corporation. Electric lamp package and carton therefor. 4,561,542, Cl. 206-418.000.

Pugnale, Peter J.; Clark, John M.; and Penland, William R., to Owens-Corning Fiberglas Corporation. Double-wall underground container for storing liquids and leak detecting means therefor. 4,561,292, Cl. 73-49.200.

Punk, Peter: *See—*
Prager, Bernhard C.; Punk, Peter; and Thaler, Heinrich, 4,562,253, Cl. 544-19.000.

Quan, Frederic J-Y, to Corning Glass Works. Optical waveguide splicing apparatus and method. 4,561,719, Cl. 350-96.210.

Quietlite International Ltd.: *See—*
Elliott, William J., 4,562,382, Cl. 315-219.000.

Quin, Rene ; Wiet, Paul; and Migliarese-Caputi, Jean-Louis, to Compagnie Francaise des Petroles. Hydraulic shock-absorbing jack. 4,561,248, Cl. 60-413.000.

Quipp, Incorporated: *See—*
Sjogren, Christer A.; McRae, John; and Reyes, Carlos, 4,562,339, Cl. 235-98.00R.

R. A. Couche & Associates Pty. Ltd.: *See—*
Couche, Raymond A., 4,561,980, Cl. 210-486.000.

R. D. Werner Co., Inc.: *See—*
Bayer, Thomas E., 4,561,165, Cl. 29-522.00R.

R. J. Reynolds Tobacco: *See—*
Guess, Hal E., 4,561,454, Cl. 131-365.000.

Rabin, Ronald J.: *See—*
Freeny, Charles C., Jr.; and Rabin, Ronald J., 4,561,848, Cl. 434-18.000.

Rabindran, K. George: *See—*
Svyatsky, Eduard; and Rabindran, K. George, 4,561,352, Cl. 101-2.000.

Rabson, Thomas A. Periodic reciprocating motor. 4,562,385, Cl. 318-135.000.

Rabuse, George R.; and Hanson, Gary R., to Minnesota Mining and Manufacturing Company. Roll of predetermined length strips of pressure-sensitive tape. 4,562,102, Cl. 428-43.000.

Racal-Milgo Limited: *See—*
Turner, Laurence F.; Bailey, John W.; and Parrish, Henry H., 4,562,425, Cl. 340-347.0DD.

Rachor, Lothar: *See—*
Hrovat, Milan; Huschka, Hans; Rachor, Lothar; and Vollath, Dieter, 4,562,017, Cl. 264-0.500.

Radford, Wade E.: *See—*
Hogrefe, Arthur F.; and Radford, Wade E., 4,561,443, Cl. 128-419.0PG.

Radiation Dynamics, Inc.: *See—*
Burgess, Robert G., 4,561,358, Cl. 104-89.000.

Radziemski, Leon J.; and Cremers, David A., to United States of America, Energy. Apparatus and method for quantitative determination of materials contained in fluids. 4,561,777, Cl. 356-318.000.

Raffelson, Harold: *See—*
Wrobleski, James T.; Edwards, James W.; Graham, Charles R.; Keppel, Robert A.; and Raffelson, Harold, 4,562,268, Cl. 549-259.000.

Raicu, Bruha. Process for forming low sheet resistance polysilicon having anisotropic etch characteristics. 4,561,907, Cl. 148-1.500.

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Tisserat, Craig R., 4,561,682, Cl. 285-305.000.

Rajadhyaksha, Vithal J., to Nelson Research & Development Co. Penetration enhancers for transdermal drug delivery of systemic agents. 4,562,075, Cl. 514-788.000.

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Hegasy, Ahmed; Rupp, Roland; Ramsch, Klaus-Dieter; and Luchtenberg, Helmut, 4,562,069, Cl. 424-80.000.

Ranade, Gautam R.: *See*—
Walker, Leigh E.; and Ranade, Gautam R., 4,562,229, Cl. 525-71.000.
Rancer, Karl E. Apparatus for framing fabric in embroidery hoops. 4,561,177, Cl. 29-721.000.
Randar, Magnus; and Moore, David G., to Artos Engineering Company. Cord manufacturing apparatus and connector attachment machine therefor. 4,561,155, Cl. 29-33.00M.
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Brockway, Brock F.; Moretti, Anthony L.; Pellolio, Anselmo P.; and Rasmussen, Jimmie, 4,561,162, Cl. 29-428.000.
Rasshofer, Werner: *See*—
Hajek, Manfred; Muller, Hanns P.; and Rasshofer, Werner, 4,562,289, Cl. 564-2.000.
Ratcliffe, Michael J., to International Computers Limited. Data storage apparatus. 4,562,576, Cl. 371-21.000.
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Altmann, Josef; and Ratislav, Jaromir, 4,561,866, Cl. 55-166.000.
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Thiemann, Karl-Heinz; Weinert, Hans-Juergen; and Rauchle, Wilfried, 4,562,121, Cl. 428-607.000.
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Rausch, Karl W., Jr.: *See*—
Chen, Augustin T.; Onder, Kemal; and Rausch, Karl W., Jr., 4,562,228, Cl. 525-66.000.
Ravet, Jean-Paul: *See*—
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Raychem Corporation: *See*—
Tomlinson, Andrew; and Taylor, James M., 4,562,313, Cl. 179-175.000.
Raytheon Company: *See*—
Dionne, Norman J., 4,562,380, Cl. 315-4.000.
RCA Corporation: *See*—
Axelrod, Randolph H.; and Piascinski, Joseph J., 4,562,120, Cl. 428-469.000.
Bolger, Thomas V., 4,562,456, Cl. 358-13.000.
Carlson, David J., 4,562,472, Cl. 358-197.000.
Chen, John; Huang, Chin; Graves, Nancy D.; and Hicks, James E., 4,562,508, Cl. 361-91.000.
Colacello, Michael A.; Fitzke, Emil V.; and Otto, Jack F., 4,561,874, Cl. 65-36.000.
Harwood, Leopold A., 4,562,460, Cl. 358-28.000.
Hurst, Robert N., Jr.; and Plotnick, Michael A., 4,562,487, Cl. 358-342.000.
Levine, Peter A., 4,562,473, Cl. 358-213.000.
Levine, Peter A., 4,562,475, Cl. 358-213.000.
McDonald, James A., 4,562,479, Cl. 358-243.000.
Olikara, Philip; and Binge, Derek S., 4,561,614, Cl. 244-173.000.
O'Rourke, David P., 4,562,410, Cl. 331-1.00A.
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Ritt, Peter M.; and Saulnier-Ebert, Mary L., 4,561,931, Cl. 156-640.000.
Sepp, Walter E., 4,562,458, Cl. 358-21.00R.
Simshauser, Elvin D., 4,561,215, Cl. 51-165.750.
Whitley, George J., 4,561,166, Cl. 29-566.300.
Readshaw, Ronald L.: *See*—
Walter, Andrew T.; Bryant, George M.; and Readshaw, Ronald L., 4,562,097, Cl. 427-209.000.
Real, Francisco X.; Mattes, M. Jules; Houghton, Alan N.; Livingston, Philip O.; Lloyd, Kenneth O.; Oettgen, Herbert F.; and Old, Lloyd J., to Sloan-Kettering Institute. Melanoma tumor antigen and autologous antibody. 4,562,160, Cl. 436-539.000.
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Kreischer, Cody B., 4,561,733, Cl. 350-618.000.
Reczek, James A., to Eastman Kodak Company. Photographic products employing novel nondiffusible metal complexes of azo dyes. 4,562,139, Cl. 430-223.000.
Redfield, James W.; and Charpentier, Albert J., to Commodore Business Machines, Inc. Display logic circuit for multiple object priority. 4,561,659, Cl. 273-313.000.
Redfield, James W., to Commodore Business Machines Inc. Clocked self booting logical "EXCLUSIVE OR" circuit. 4,562,365, Cl. 307-471.000.
Reed Lignin Inc.: *See*—
Lin, Stephen Y., 4,562,236, Cl. 527-400.000.
Reeve, Randy F., to Calmar, Inc. Child resistant container. 4,561,544, Cl. 206-540.000.
Regie Nationale des Usines Renault: *See*—
Leddet, Philippe, 4,561,176, Cl. 29-709.000.
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Elbe, Hans-Ludwig; Jautelat, Manfred; Buchel, Karl H.; Brandes, Wilhelm; Hanssler, Gerd; and Reinecke, Paul, 4,562,198, Cl. 514-383.000.
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Reitz, Kay M.: *See*—
Peralta, Eduardo J.; and Reitz, Kay M., 4,562,439, Cl. 343-17.10R.
Renner, Alfred, to Ciba-Geigy Corporation. Diurethane diureas and the use thereof. 4,562,241, Cl. 528-99.000.
Repco Limited: *See*—
Wood, Harold L., 4,561,332, Cl. 81-479.000.
Rescalli, Carlo: *See*—
Gazzi, Luigi; D'Ambra, Roberto; Di Cintio, Roberto; Rescalli, Carlo; and Vetere, Alessandro, 4,561,869, Cl. 62-17.000.
Return on Investment Corporation: *See*—
Hilton, Carl W.; and Bullard, Harold L., 4,561,517, Cl. 180-175.000.
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Sjogren, Christer A.; McRae, John; and Reyes, Carlos, 4,562,339, Cl. 235-98.00R.
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Stewart, Douglas V.; and Tabereaux, Alton T., 4,561,958, Cl. 204-243.00R.
Ricci, Marco: *See*—
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Ricciardi, Robert P.; Barbanti-Brodano, Giuseppe; and Milanesi, Gabriele, to Wistar Institute of Anatomy and Biology, The. Hybrid viral plasmid and microorganisms containing same. 4,562,155, Cl. 435-172.300.
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Rich, Leonard G., to Metromedia, Inc. Apparatus and method for driving ink jet printer. 4,562,445, Cl. 346-140.00R.
Richard Wolf GmbH: *See*—
Bonnet, Ludwig; and Bitrolf, Ehrenfried, 4,561,438, Cl. 128-328.000.
Richards, Lorenzo A. Matric suction sensor. 4,561,293, Cl. 73-73.000.
Richman, Lonnie J.; and Stockmaster, Edward F., to Babcock & Wilcox Company, The. Vent cover. 4,561,558, Cl. 220-203.000.
Ricoh Company, Ltd.: *See*—
Inoue, Satoru; Uchida, Mitsuru; Yamaguchi, Kimitoshi; Aoki, Mitsuo; Tomita, Masami; and Uematsu, Chiaki, 4,562,136, Cl. 430-107.000.
Jinnai, Koichiro; and Horike, Masanori, 4,562,442, Cl. 346-75.000.
Kaneko, Toshio; Sakamoto, Koji; Kanno, Fuchio; and Yasuda, Wataru, 4,561,381, Cl. 118-652.000.
Kurokawa, Hiroshi; Kurokawa, Sunji; and Saito, Yuichi, 4,562,483, Cl. 358-257.000.
Machida, Hazime; and Tanaka, Motoharu, 4,562,105, Cl. 428-161.000.
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Rieber, Norbert; Bohm, Heinrich; Platz, Rolf; and Fuchs, Werner, to BASF Aktiengesellschaft. Preparation of polycyclic nitrogen-containing compounds. 4,562,262, Cl. 548-257.000.
Rietbrock, Peter; and Knapke, Gerhard. Electromagnetically operated leaf shutter. 4,561,744, Cl. 354-234.100.
Rikagaku Kenkyusho: *See*—
Nagamune, Teruyuki; Inoue, Ichiro; and Takematsu, Noburu, 4,561,779, Cl. 356-442.000.
Rimington, David J.: *See*—
Tremain, David L.; Beach, Burt L.; and Rimington, David J., 4,561,305, Cl. 73-323.000.
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Ringel, Helmut, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Process for the separation of krypton from a radioactive waste gas mixture and arrangement for implementing the process. 4,562,000, Cl. 252-630.000.
Rionda, Carlos S.; and Palacio, Joaquin J., to Gang-Nail Systems, Inc. Truss assembly and truss hanger and connector hanger for use with trusses. 4,561,230, Cl. 52-289.000.
Riou, Armand: *See*—
Clapp, Craig S. K.; Shilston, Norman L.; Jolivet, Jean-Claude R.; Devimeux, Daniel P.; and Riou, Armand, 4,562,466, Cl. 358-133.000.
Ritt, Peter M.; and Saulnier-Ebert, Mary L., to RCA Corporation. Method including producing a stencil from layer of dichromate-sensitized PVA and fluorescein-type dye. 4,561,931, Cl. 156-640.000.
Rittal-Werk Rudolf Loh GmbH & Co. KG: *See*—
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RJR Archer, Inc.: *See*—
Fleming, William F., III; and Jones, Roger D., 4,561,579, Cl. 225-2.000.
Roanoke College: *See*—
Frantz, Virgil L., 4,561,464, Cl. 137-596.180.
Roba, Joseph L.: *See*—
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Robert Bosch GmbH: *See*—
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Bonitz, Jorg; Entenmann, Robert; Killi, Geza; Knab, Rochus; Miller, Bernhard; Rohde, Siegfried; and Viess, Walter, 4,562,544, Cl. 364-431.110.

Buchschmid, Emil; Gademann, Lothar; Hirt, Adam; Huttinger, Manfred; Jahn, Hans P.; Orova, Josef; Schmid, Hans-Dieter; and Steffen, Horst-Gunter, 4,561,410, Cl. 123-599.000.

Gerber, Richard; and Trautwein, Dieter, 4,562,317, Cl. 200-19.0DR.

Heinz, Jutta; Sautter, Helmut; Schink, Rainer; and Weber, Lothar, 4,561,729, Cl. 350-357.000.

Jahnke, Horst; Moro, Brigitte; Scholz, Erich; and Siebke, Hans, 4,562,431, Cl. 340-604.000.

Jundt, Wolfgang; Schaal, Gunter; Schadlich, Fritz; Vogt, Hans-Joachim; and Wunsch, Steffen, 4,562,389, Cl. 318-432.000.

Neumann, Gerhard, 4,561,839, Cl. 431-6.000.

Sumal, Jaihind S.; and Gneiss, Heinz, 4,561,302, Cl. 73-202.000.

Robillard, David R.; Bullock, Robert J.; and Marino, Jerry C., to Prime Computer, Inc. Movable CRT pedestal. 4,561,619, Cl. 248-285.000.

Robin, David J.: *See—*
Bauer, Martin W.; Thys, Carl J.; Fredriksen, Peter A.; Robin, David J.; and Schaar, Richard J., 4,562,595, Cl. 455-345.000.

Robinson, Alan A., to Agence Spatiale Europeenne. Position detection device for magnetic bearing. 4,562,430, Cl. 340-870.370.

Robinson, Forrest J. Doorknob security apparatus. 4,561,273, Cl. 70-426.000.

Robinson, Genevieve T. Bracket assembly for inverting gutter to dump accumulated debris. 4,561,616, Cl. 248-48.200.

Roca Nierga, Manuel, to Spica S.p.A. Injection pump regulator systems for internal combustion engines. 4,561,398, Cl. 123-449.000.

Rockwell International Corporation: *See—*
Walter, Robert J.; Lewis, Jack R.; and Moss, Charles M., 4,562,332, Cl. 219-121.0EM.
Wykes, John H.; and Miller, Gerald D., 4,562,546, Cl. 364-434.000.

Rodel, Gerhard; and Wolfel, Werner, to International Standard Electric Corporation. Power supply. 4,562,523, Cl. 363-21.000.

Roehl, Ernst-Ludwig, to Naarden International N.V. Process for the preparation of air-refreshing gels as well as the obtained gels. 4,561,997, Cl. 252-522.00A.

Rogers, Mario: *See—*
Zuber, Pierre A.; and Rogers, Mario, 4,562,543, Cl. 364-426.000.

Rogers, Mark C.: *See—*
Gill, Michael T.; and Rogers, Mark C., 4,561,424, Cl. 126-438.000.

Rogers, Russell L., to Aeroquip Corporation. Axial flow pressure regulator. 4,561,465, Cl. 137-614.050.

Rogerson, Alan G., to Sterling Drug Inc. Process for preparing granulate containing poorly compressible medicinally active matter. 4,562,024, Cl. 264-117.000.

Rogler, Wolfgang; Markert, Helmut; Kretzschmar, Klaus; and Piecha, Gerhard, to Siemens Aktiengesellschaft. Heat-hardenable reaction resin mixtures comprising polyfunctional epoxide, polyisocyanate prepolymer and a reaction accelerator which is either a tertiary amine or i midazole. 4,562,227, Cl. 524-786.000.

Rohde, Siegfried: *See—*
Bonitz, Jorg; Entenmann, Robert; Killi, Geza; Knab, Rochus; Miller, Bernhard; Rohde, Siegfried; and Viess, Walter, 4,562,544, Cl. 364-431.110.

Rohm GmbH Chemische Fabrik: *See—*
Besecke, Siegmund; and Schroder, Gunter, 4,562,234, Cl. 526-241.000.

Rohr, Wolfgang: *See—*
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Rolls-Royce Limited: *See—*
Johnson, Frank C.; and Newsam, Susan M., 4,562,033, Cl. 264-510.000.
Kwan, William C. T.; and Pidcock, Anthony, 4,561,257, Cl. 60-737.000.
Slack, John D., 4,561,491, Cl. 164-516.000.

Roper Corporation: *See—*
Davis, Robert K., deceased, 4,562,125, Cl. 429-65.000.

Roper, Jerry M., to Ethyl Corporation. Spiroketone process. 4,562,293, Cl. 568-347.000.

Roper, Jerry M., to Ethyl Corporation. Spiroketone process. 4,562,294, Cl. 568-362.000.

Roper, Jerry M., to Ethyl Corporation. Aldehyde synthesis. 4,562,297, Cl. 568-432.000.

Rose, Gene R., to Clark Michigan Company. Hydrodynamic transmission reversal control. 4,561,247, Cl. 60-335.000.

Roseto, Frank N. Chatter free rotary friction device and method of making the same. 4,561,533, Cl. 192-107.00M.

Rosner, Stanley S. Method and apparatus for determining pressure differentials. 4,561,309, Cl. 73-705.000.

Ross, Ludwig: *See—*
Mennemann, Karl; Gliemeroth, Georg; Ross, Ludwig; Speit, Burkhard; Geiler, Volkmar; Krolla, Hans-Georg; and Meckel, Lothar, 4,562,161, Cl. 501-59.000.

Rossi, Robert K., to Goodyear Tire & Rubber Company, The. Process for casting reinforced tires. 4,562,031, Cl. 264-255.000.

Rothchild, Ronald D. Treatment of tobacco under pressure in a continuous process. 4,561,453, Cl. 131-304.000.

Rouaud, Christian: *See—*
de Villepoix, Raymond; Fages, Jean; Forges, Robert; Abbes, Claude; and Rouaud, Christian, 4,561,662, Cl. 277-229.000.

Rouse, David G.; and Wilkinson, Christopher F., to Marconi Company Limited, The. Radar apparatus. 4,562,438, Cl. 343-17.10R.

Rouse, Michael W.; and Thelen, Robert L., to Waste Recovery, Inc. Triple gate valve assembly. 4,561,467, Cl. 137-624.180.

Roussel Uclaf: *See—*
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,562,282, Cl. 560-184.000.

Rovel, Jean-Marie: *See—*
Bernard, Jacques; Rovel, Jean-Marie; Nicol, Roger; and Prevot, Claude, 4,561,974, Cl. 210-151.000.

Rowland, Robert O., to Hudson Oxygen Therapy Sales Company. Oxygen concentrator. 4,561,287, Cl. 73-23.000.

Roy, Daniel, to Sappel. Turbine for a multijet liquid flow meter. 4,561,312, Cl. 73-861.810.

Royster Company, The: *See—*
Capps, Ernest R., 4,561,818, Cl. 414-301.000.

Rub, Walter; and Bruggemann, Ulrich, to VDO Adolf Schindling AG. Damped stepping motor for the driving of a measuring mechanism, particularly a roller counting mechanism having a control circuit arrangement. 4,562,395, Cl. 318-696.000.

Rubin, Fred K.; Blarcom, David V.; and Fox, Daniel J., to Lever Brothers Company. Surfactant free stable hypochlorite paste. 4,561,994, Cl. 252-187.230.

Rubin, Harvey: *See—*
Coleman, Charles L.; and Rubin, Harvey, 4,562,436, Cl. 340-825.000.

Ruf, Hermann. Positioning device for an extension and repositioning apparatus. 4,562,588, Cl. 378-208.000.

Ruggiero, Frank J., to Alfa-Laval, Inc. Production of fruit preserves. 4,562,085, Cl. 426-577.000.

Ruhle, Walter: *See—*
Bolz, Ludwig; and Ruhle, Walter, 4,561,316, Cl. 74-7.00E.

Ruka, Roswell J., to Westinghouse Electric Corp. Air electrode material for high temperature electrochemical cells. 4,562,124, Cl. 429-30.000.

Rupp, Roland: *See—*
Hegasy, Ahmed; Rupp, Roland; Ramsch, Klaus-Dieter; and Luchtenberg, Helmut, 4,562,069, Cl. 424-80.000.

Rutan, Fred E.; and Chmelar, Mark A., to Deere & Company. Fuel tank venting valve. 4,561,559, Cl. 220-203.000.

S. A. Platt, Inc.: *See—*
Platt, Stephen A., 4,561,278, Cl. 72-142.000.

S&C Electric Company: *See—*
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Saari, Kaarlo M. J.: *See—*
Heimala, Seppo O.; and Saari, Kaarlo M. J., 4,561,970, Cl. 209-3.000.

Sachdev, Harbans S.; and Sachdev, Krishna G., to International Business Machines Corporation. Use of plasma polymerized orgaosilicon films in fabrication of lift-off masks. 4,562,091, Cl. 427-41.000.

Sachdev, Krishna G.: *See—*
Sachdev, Harbans S.; and Sachdev, Krishna G., 4,562,091, Cl. 427-41.000.

Sacks, Norman L. Intravenous filter retainer. 4,561,857, Cl. 604-174.000.

Sadler, Karl-Otto: *See—*
Franz, Hans-Joachim; Sadler, Karl-Otto; and Schmidt, Willi, 4,561,372, Cl. 114-74.00R.

Saegusa, Takashi: *See—*
Miyamoto, Hidenori; and Saegusa, Takashi, 4,561,752, Cl. 354-432.000.

Saftien, Udo: *See—*
Enke, Kurt; Hespelt, Achim; Hertler, Eberhard; von der Ohe, Manfred; and Saftien, Udo, 4,561,640, Cl. 267-20.00A.

Sagara, Hiroji, to Hoya Corporation. Glass for multi-focal eyeglass lens. 4,562,162, Cl. 501-60.000.

Saint Gobain Vitrage: *See—*
Coulon, Jean-Claude; and Douche, Jean-Pierre, 4,562,095, Cl. 427-180.000.
Mario, Roth; and Gunther, Termath, 4,562,093, Cl. 427-109.000.

Saita, Toshikazu; Hino, Toshiyuki; and Matsumura, Masami, to Mitsubishi Denki Kabushiki Kaisha. Ignition apparatus for internal combustion engines. 4,561,412, Cl. 123-617.000.

Saito, Fuminari; Kajino, Jirou; and Kanchiku, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Magnetic tape recording and/or reproducing apparatus. 4,562,496, Cl. 360-85.000.

Saito, Kaneo, to Konishiroku Photo Industry Co., Ltd. Film mounting device. 4,561,167, Cl. 29-564.600.

Saito, Susumu: *See—*
Kataoka, Keiji; Saito, Susumu; Arimoto, Akira; Hashimoto, Akira; and Tatsuno, Kimio, 4,561,717, Cl. 350-6.800.

Saito, Takashi, to Nippon Telegraph & Telephone Public Corp. Thermal ink transfer printing system. 4,561,789, Cl. 400-120.000.

Saito, Tohru: *See—*
Ichikawa, Masashi; Takahashi, Yasuo; and Saito, Tohru, 4,561,561, Cl. 220-270.000.

Saito, Toshiyuki; Okubo, Naofumi; and Kaneko, Yoshiaki, to Fujitsu Limited. Cavity resonator coupling-type power distributor/power combiner. 4,562,409, Cl. 330-286.000.

Saito, Yuichi: *See—*
Kurokawa, Hiroshi; Kurokawa, Sunji; and Saito, Yuichi, 4,562,483, Cl. 358-257.000.

Saitoh, Minoru: *See—*
Yamane, Noriomi; Arimatsu, Yoshikazu; Katsuo, Kenichi; Saitoh, Minoru; Tani, Katsya; Mitamura, Hideyuki; and Hiroyoshi, Kamatani, 4,562,239, Cl. 528-65.800.

Saitoh, Takashi: *See—*
Okuno, Eiichi; Okamura, Naomi; and Saitoh, Takashi, 4,562,237, Cl. 528-17.000.

Saitto, Antonio: *See—*
Beretta, Guiliano; and Saitto, Antonio, 4,562,441, Cl. 343-781.00P.

Sajima, Yasuo: *See—*
Suhara, Manabu; Sajima, Yasuo; Ito, Hiroaki; and Arai, Kiyotaka, 4,561,946, Cl. 204-98.000.

Sakaguchi, Keizo; and Takeuchi, Shigeru, to Kurimoto Iron Works, Ltd. Process for manufacture of glass fiber-reinforced cement non-plate article. 4,562,030, Cl. 264-173.000.

Sakai, Kazuaki; Sato, Tuneyasu; and Chiba, Kazuhiko, to Kawasaki Kasei Chemicals Ltd. Process for removing anthraquinone type scale. 4,561,935, Cl. 162-30.100.

Sakai, Keijiro: *See—*
Mutoh, Nobuyoshi; Sakai, Keijiro; Hattori, Motonobu; and Nagato, Yuichiro, 4,562,524, Cl. 363-41.000.

Sakakibara, Kazuo; Shimogawa, Toshiaki; Kato, Masahiko; and Matsuoka, Fumio, to Nippon Soken, Inc.; and Toyota Jidosha Kabushiki Kaisha. Seat belt retractor of automobile. 4,561,606, Cl. 242-107.000.

Sakakibara, Sakuichi; Tokuda, Yoshiaki; Nagai, Tamio; Mikata, Yoshitaka; and Nishide, Kazuhiro, to House Food Industrial Company, Limited; and Yamato Scale Company, Limited. Combination weighing machine. 4,561,509, Cl. 177-25.000.

Sakakibara, Shinsuke: *See—*
Inaba, Hajimu; Sakakibara, Shinsuke; and Nihei, Ryo, 4,562,551, Cl. 364-513.000.

Sakakiyama, Ryuzo, to Fuji Jukogyo Kabushiki Kaisha. System for controlling a power transmission of a four-wheel drive vehicle. 4,562,541, Cl. 364-424.100.

Sakamaki, Hiroshi; Sugishita, Susumu; and Horikoshi, Yukio, to Nippon Piston Ring Kabushiki Kaisha. Floating rotary sleeve of a rotary compressor. 4,561,835, Cl. 418-173.000.

Sakamoto, Koji: *See—*
Kaneko, Toshio; Sakamoto, Koji; Kanno, Fuchio; and Yasuda, Wataru, 4,561,381, Cl. 118-652.000.

Sakamoto, Yoshiyuki; and Wataya, Seiji, to Mitsubishi Denki Kabushiki Kaisha. Fuel control apparatus for an internal combustion engine. 4,561,396, Cl. 123-198.00E.

Sakata, Hideo; and Yamashiro, Hiroshi, to Mitutoyo Mfg. Co., Ltd. Measuring instrument. 4,561,185, Cl. 33-164.00R.

Sakata, Hideo: *See—*
Yamamoto, Takeshi; Sakata, Hideo; and Sugizaki, Iwao, 4,561,190, Cl. 33-561.000.

Sakata, Tomoaki, to Hitachi, Ltd. Apparatus for fetching component parts. 4,561,825, Cl. 414-753.000.

Sakazume, Akio: *See—*
Iwata, Hiroshi; Takebayashi, Masahiro; Sakazume, Akio; Uneyama, Yoshihisa; Sekigami, Kazuo; Tagawa, Shigetaro; and Sugiyama, Masahiko, 4,561,829, Cl. 417-368.000.

Sako, Yoichiro: *See—*
Odaka, Kentaro; Sako, Yoichiro; Kojima, Yuichi; Nakano, Kenji; and Moriwaki, Hisayoshi, 4,562,578, Cl. 371-40.000.

Sakurai, Kazuhiro: *See—*
Idogaki, Takaharu; Hayashi, Ikuo; Kawai, Hisasi; Hattori, Kyo; and Sakurai, Kazuhiro, 4,561,629, Cl. 251-65.000.

Sakurai, Masao: *See—*
Nishi, Yasuyuki; Takagi, Masashi; and Sakurai, Masao, 4,561,260, Cl. 62-115.000.

Saladin, Herbert A.: *See—*
Schultz, Warren J.; and Saladin, Herbert A., 4,562,454, Cl. 357-51.000.

Salomon, James A.; and Weikel, Donald J., Jr., to Xerox Corporation. Belt support apparatus. 4,561,757, Cl. 355-3.0BE.

Salomon S.A.: *See—*
Pascal, Roger; and Bressand, Rene, 4,561,673, Cl. 280-629.000.
Petrini, Roland; and De Marchi, Jean-Louis, 4,561,196, Cl. 36-118.000.

Salvalai, Italo: *See—*
Jeannot, Michel; and Salvalai, Italo, 4,561,960, Cl. 204-297.00W.

Salvia, Frank, to Grumman Aerospace Corporation. Sync generator, video processor. 4,562,457, Cl. 358-19.000.

Samejima, Mutsumi: *See—*
Koga, Kunio; Sasaki, Yukihiro; and Samejima, Mutsumi, 4,562,288, Cl. 562-608.000.

Sams, Bernard: *See—*
Chapman, Richard H.; and Sams, Bernard, 4,561,353, Cl. 101-111.000.

Samsonite Corporation: *See—*
Winter, Roger D.; and Jennings, James K., Jr., 4,561,526, Cl. 190-115.000.

Samuelson, Hans O., to Mo och Domsjo Aktiebolag. Process for the conversion of lignocellulosic material to cellulose pulp by alkaline preoxidation followed by alkaline oxygen-free digestion both in the presence of a redox additive. 4,561,936, Cl. 162-45.000.

Sanborn, George A. Method and apparatus for sky typing. 4,561,201, Cl. 40-213.000.

Sanchez, Michael A. Cable connector cover with integral strain relief. 4,561,715, Cl. 339-103.00R.

Sanden Corporation: *See—*
Negishi, Hideo, 4,561,564, Cl. 221-64.000.
Shimizu, Shigemi, 4,561,832, Cl. 418-55.000.

Sanders Associates, Inc.: *See—*
Pothier, Robert G., 4,562,440, Cl. 343-703.000.
Sedivec, Darrel F., 4,562,416, Cl. 333-26.000.
Sinclair, Ronald R.; and Nussdorfer, Theodore J., 4,561,611, Cl. 244-3.160.

Sanders, Frederick W., to Mead Corporation, The. Photosensitive material employing encapsulated radiation sensitive composition. 4,562,137, Cl. 430-138.000.

Sandy Hill Corporation: *See—*
Keller, Martin B., 4,561,937, Cl. 162-286.000.

Sanford, William D. Recreational watercraft. 4,561,370, Cl. 114-56.000.

Sankyo Company Limited: *See—*
Yamamoto, Shinjiro; Yokoi, Shinji; Matsumoto, Keigo; Honda, Takeo; and Kobayashi, Takashi, 4,562,193, Cl. 514-358.000.

Sansa, Jose V., to Componentes Electronicos SA-C.S.A. Polarized electronic component and its manufacturing process. 4,562,514, Cl. 361-433.000.

Sanyo Electric Co., Ltd.: *See—*
Tadanobu, Yamazawa; and Kentaro, Inoue, 4,562,378, Cl. 313-499.000.

Sapienza, Richard S.: *See—*
Slegeir, William A.; Healy, Francis E.; and Sapienza, Richard S., 4,561,859, Cl. 44-1.0SR.

Sappel: *See—*
Roy, Daniel, 4,561,312, Cl. 73-861.810.

Sargent, Colin R.: *See—*
Tatlow, John C.; Plevey, Raymond G.; Wotton, David E. M.; and Sargent, Colin R., 4,562,183, Cl. 514-214.000.

Sarka, Albert J., to Bernal Rotary Systems, Inc. Rotary stripper. 4,561,334, Cl. 83-27.000.

Sasaki, Hirokazu; Morita, Akira; and Yamamoto, Takemasa, to Fuji Photo Film Co., Ltd.; and Nippon Light Metal Co., Ltd. Method for producing supports for lithographic printing plates. 4,561,944, Cl. 204-33.000.

Sasaki, Hiroshi: *See—*
Kudo, Hiroyuki; Watanabe, Atsumi; and Sasaki, Hiroshi, 4,562,507, Cl. 361-85.000.

Sasaki, Isao: *See—*
Kishida, Kazuo; Sasaki, Isao; and Mori, Hiroshi, 4,562,216, Cl. 523-433.000.

Sasaki, Michiaki, to Nissan Motor Company, Limited. Contractible fuel filter device. 4,561,977, Cl. 210-356.000.

Sasaki, Osamu; Hirose, Naohiro; and Sawada, Kiyoshi, to Konishiroku Photo Industry Co., Ltd. Photoreceptor containing a trisazo compound for use in electrophotography. 4,562,131, Cl. 430-58.000.

Sasaki, Shunroku; Tsukada, Kazuo; Kanzaki, Yoshiharu; and Hori, Yoshikazu, to Fujitsu Limited. Digital loop filter. 4,562,437, Cl. 343-394.000.

Sasaki, Tsutomu, to Billcon Co., Ltd. Coin sorter and counter. 4,561,457, Cl. 133-3.00G.

Sasaki, Yukihiro: *See—*
Koga, Kunio; Sasaki, Yukihiro; and Samejima, Mutsumi, 4,562,288, Cl. 562-608.000.

Sasamori, Yusuke: *See—*
Yamaguchi, Isao; Sasamori, Yusuke; and Takaoka, Hideo, 4,561,770, Cl. 355-57.000.

Sashida, Toshiiku. Motor device utilizing ultrasonic oscillation. 4,562,374, Cl. 310-328.000.

Satake, Keigo: *See—*
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizu, Susumu; Watanabe, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,561,877, Cl. 71-90.000.

Sato, Hiroshi, to Canon Kabushiki Kaisha. Projection exposure apparatus. 4,561,773, Cl. 355-43.000.

Sato, Junichi: *See—*
Kawauchi, Kazunori; and Sato, Junichi, 4,561,481, Cl. 152-379.300.

Sato, Ken; Takahashi, Yutaka; Tsukaya, Takashi; Kato, Shinichi; and Hattori, Shinichiro, to Olympus Optical Co., Ltd. Flashlight control apparatus for endoscope. 4,561,429, Cl. 128-6.000.

Sato, Mikio: *See—*
Yamaguchi, Motoo; Sone, Isamu; Hirasawa, Kunio; Yoshioka, Yoshio; Nishikawa, Akio; Suzuki, Hiroshi; Sato, Mikio; and Hosokawa, Masao, 4,562,322, Cl. 200-148.00G.

Sato, Tadao: *See—*
Endo, Tadashi; Sato, Tadao; and Fukunaga, Osamu, 4,562,163, Cl. 501-96.000.

Sato, Tuneyasu: *See—*
Sakai, Kazuaki; Sato, Tuneyasu; and Chiba, Kazuhiko, 4,561,935, Cl. 162-30.100.

Satoh, Makoto: *See—*
Fujii, Etsuo; Satoh, Makoto; and Toyoda, Mitsuo, 4,561,701, Cl. 303-119.000.

Satou, Takanori: *See—*
Shimizu, Toshio; Satou, Takanori; Tsukui, Tsutomu; Doi, Ryouta; and Yamaguchi, Motoo, 4,562,123, Cl. 429-27.000.

Saulnier-Ebert, Mary L.: *See—*
Ritt, Peter M.; and Saulnier-Ebert, Mary L., 4,561,931, Cl. 156-640.000.

Saurer-Allma GmbH: *See—*
Greive, Aloys; and Leuthold, Dieter, 4,561,600, Cl. 242-18.0DD.

Sautter, Helmut: *See—*
Heinz, Jutta; Sautter, Helmut; Schink, Rainer; and Weber, Lothar, 4,561,729, Cl. 350-357.000.

Sawada, Kiyoshi: *See—*
Sasaki, Osamu; Hirose, Naohiro; and Sawada, Kiyoshi, 4,562,131, Cl. 430-58.000.

Sawanishi, Shigeru; and Wakitani, Mitsuru, to Japan Exlan Company Limited. Water-absorbing acrylic fibers. 4,562,114, Cl. 428-372.000.

Sawataishi, Tokio: *See—*
Sugawara, Mitsutoshi; Tokuda, Kazuo; and Sawataishi, Tokio, 4,562,412, Cl. 331-53.000.
Sazanami, Tsuneo: *See—*
Watanabe, Keiichiro; Yamada, Tomiaki; Sazanami, Tsuneo; and Asahara, Eiko, 4,562,154, Cl. 435-162.000.
Scan Screen A/S: *See—*
Clausen, Erik; and Clausen, Johannes, 4,561,720, Cl. 350-128.000.
Schaal, Gunter: *See—*
Jundt, Wolfgang; Schaal, Gunter; Schadlich, Fritz; Vogt, Hans-Joachim; and Wunsch, Steffen, 4,562,389, Cl. 318-432.000.
Schaar, Richard J.: *See—*
Bauer, Martin W.; Thys, Carl J.; Fredriksen, Peter A.; Robin, David J.; and Schaar, Richard J., 4,562,595, Cl. 455-345.000.
Schadlich, Fritz: *See—*
Jundt, Wolfgang; Schaal, Gunter; Schadlich, Fritz; Vogt, Hans-Joachim; and Wunsch, Steffen, 4,562,389, Cl. 318-432.000.
Schafer, Gerhard, to Fritz Schafer Gesellschaft mit beschrankter Haftung. Compartmented transport and storage container. 4,561,705, Cl. 312-244.000.
Scharboneau, Gerald L., to Van Wallaghen, Jack, a part interest. Lock bypassing tool. 4,561,271, Cl. 70-399.000.
Scharfenberg, Paul M.; and Findley, Kenneth N., Jr., to Findley Adhesives, Inc. Method of manufacturing corrugated paperboard product using a foamed adhesive. 4,561,918, Cl. 156-78.000.
Scharper S.p.A. per l'Industria Farmaceutica: *See—*
Del Vecchio, Alfonso; and Sestini, Grazia, 4,562,287, Cl. 562-492.000.
Schaty, Harald, to USM Corporation. Plastic fastener. 4,561,146, Cl. 16-7.000.
Schellenberg, Karl A., to Eastern Virginia Medical Authority. Solid phase scintillation counting method. 4,562,158, Cl. 436-57.000.
Scherer, George W.: *See—*
Luong, John C.; and Scherer, George W., 4,561,872, Cl. 65-18.100.
Schilling, Peter, to Westvaco Corporation. Emulsifiers for bituminous emulsions. 4,561,901, Cl. 106-277.000.
Schiminski, Herbert: *See—*
Schippers, Heinz; Lenk, Erich; Schiminski, Herbert; and Turk, Herbert, 4,561,603, Cl. 242-43.00A.
Turk, Herbert; and Schiminski, Herbert, 4,561,244, Cl. 57-336.000.
Schink, Rainer: *See—*
Heinz, Jutta; Sautter, Helmut; Schink, Rainer; and Weber, Lothar, 4,561,729, Cl. 350-357.000.
Schippers, Heinz; and Munnekehoff, Gerd, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Method and apparatus for facilitating doffing of a yarn processing machine. 4,561,602, Cl. 242-35.50A.
Schippers, Heinz; Lenk, Erich; Schiminski, Herbert; and Turk, Herbert, to Barmag Barmer Maschinenfabrik AG. Yarn traverse apparatus and method. 4,561,603, Cl. 242-43.00A.
Schirrmacher, Douglas R. Lever power system. 4,561,318, Cl. 74-54.000.
Schleimer, Francois, to Arbed S.A. Process and apparatus for heating a steel bath charged with scrap. 4,561,637, Cl. 266-81.000.
Schlich, Elmar: *See—*
Vietzke, Horst; Schlich, Elmar; Luthardt, Gunther; and Huschka, Hans, 4,562,001, Cl. 252-633.000.
Schlingmann, Merten: *See—*
Fischer, Edgar; and Schlingmann, Merten, 4,562,252, Cl. 536-114.000.
Schloss, Charles M., Jr. Self-relieving bar screen. 4,561,975, Cl. 210-155.000.
Schlosser, Viktor, to Shell Austria Aktiengesellschaft. Process of gettering semiconductor devices. 4,561,171, Cl. 29-572.000.
Schlumberger Technology Corporation: *See—*
Besson, Raymond J.; Boy, Jean-Jacques; and Valentin, Jean-Pascal, 4,562,375, Cl. 310-338.000.
Bordon, Ernesto E., 4,561,356, Cl. 102-202.100.
Devaney, Anthony J., 4,562,540, Cl. 364-400.000.
Ingram, John D.; and Macknight, Eileen E., 4,562,556, Cl. 367-26.000.
Parks, Thomas W.; and Morris, Charles F., Jr., 4,562,557, Cl. 367-27.000.
Schmeckenbecher, Arnold F.: *See—*
Arnold, Anthony F.; and Schmeckenbecher, Arnold F., 4,562,513, Cl. 361-409.000.
Schmid, Hans-Dieter: *See—*
Buchschmid, Emil; Gademann, Lothar; Hirt, Adam; Huttinger, Manfred; Jahn, Hans P.; Orova, Josef; Schmid, Hans-Dieter; and Steffen, Horst-Gunter, 4,561,410, Cl. 123-599.000.
Schmidt, Erich A.: *See—*
Schmidt, Volker; and Schmidt, Erich A., 4,561,365, Cl. 112-121.270.
Schmidt, Volker; and Schmidt, Erich A., 4,561,366, Cl. 112-121.270.
Schmidt, Hans-Georg, to Dynamit Nobel AG. Process for preparing unsaturated six-membered lactones. 4,562,270, Cl. 549-294.000.
Schmidt, Robert R.: *See—*
Thomas, Rudolf; Draber, Wilfried; Schmidt, Robert R.; and Eue, Ludwig, 4,561,879, Cl. 71-92.000.
Schmidt, Volker; and Schmidt, Erich A. Apparatus for forming cut segments of a selected length with at least one folded end. 4,561,365, Cl. 112-121.270.
Schmidt, Volker; and Schmidt, Erich A. Apparatus for holding a cut segment of a selected length. 4,561,366, Cl. 112-121.270.
Schmidt, Willi: *See—*
Franz, Hans-Joachim; Sadler, Karl-Otto; and Schmidt, Willi, 4,561,372, Cl. 114-74.00R.
Schmook, John. Apparatus for rotating a container. 4,561,822, Cl. 414-422.000.
Schnabel Foundation Company: *See—*
Weatherby, David E., 4,561,804, Cl. 405-262.000.
Schnabel, Rolf; and Weitz, Hans M., to BASF Aktiengesellschaft. Continuous separation of maleic anhydride from gaseous reaction mixtures. 4,562,283, Cl. 560-204.000.
Schneider, Heinz-Walter; Kummer, Rudolf; and Zimmerling, Dieter, to BASF Aktiengesellschaft. Isolation of methyl 4-pentenoate from mixtures containing this and methyl 3-pentenoate. 4,561,942, Cl. 203-96.000.
Schneider, Lee A., to M. A. Ford Mfg. Co., Inc. Drill. 4,561,813, Cl. 408-230.000.
Schnur, Rodney C., to Pfizer Inc. Intermediates of hypoglycemic 5-substituted oxazolidine-2,4-diones. 4,562,267, Cl. 549-58.000.
Scholz, Erich: *See—*
Jahnke, Horst; Moro, Brigitte; Scholz, Erich; and Siebke, Hans, 4,562,431, Cl. 340-604.000.
Schopplein, Leopold: *See—*
Wossner, Felix; Itzinger, Hermann; and Schopplein, Leopold, 4,561,164, Cl. 29-510.000.
Schopwinkel, Theo, to Trutzschler GmbH & Co. KG. Method and apparatus for rupturing sliver during coiler can replacement. 4,561,151, Cl. 19-159.00R.
Schott Glaswerke: *See—*
Mennemann, Karl; Gliemeroth, Georg; Ross, Ludwig; Speit, Burkhard; Geiler, Volkmar; Krolla, Hans-Georg; and Meckel, Lothar, 4,562,161, Cl. 501-59.000.
Schouten, Daniel: *See—*
Zandveld, Frederik; Schouten, Daniel; and van der Vliet, Peter C. L., 4,562,534, Cl. 364-200.000.
Schrader Machine & Tool, Inc.: *See—*
Trevarrow, David J., 4,561,815, Cl. 409-227.000.
Schroder, Gunter: *See—*
Besecke, Siegmund; and Schroder, Gunter, 4,562,234, Cl. 526-241.000.
Schroeder, Robert E.: *See—*
Andersen, Brad E.; Hamilton, Billy H.; and Schroeder, Robert E., 4,562,548, Cl. 364-483.000.
Schuler, Murry W.: *See—*
Alm, Arthur L., 4,561,972, Cl. 209-254.000.
Schultz, John R. Modular planter system. 4,561,208, Cl. 47-83.000.
Schultz, Warren J.; and Saladin, Herbert A., to Motorola, Inc. Electronic fuse for semiconductor devices. 4,562,454, Cl. 357-51.000.
Schulze, Reinhold, to SKW Trostberg Aktiengesellschaft. Process for the recovery of noble metals from ores; which process uses thiourea. 4,561,947, Cl. 204-109.000.
Schumacher, Ralf: *See—*
Struck, Carl-Heinz; Schumacher, Ralf; Kohler, Ingomar; and Leppert, Gerd-Ullrich, 4,561,843, Cl. 432-214.000.
Schurzky, Kenneth G.: *See—*
Hagerty, Robert O.; Petsche, Irena B.; and Schurzky, Kenneth G., 4,562,169, Cl. 502-107.000.
Schuster, David V. Adapter for removing diesel engine fuel injectors. 4,561,159, Cl. 29-255.000.
Schwander, Hansrudolf; and Hurter, Rudolf, to Ciba-Geigy Corporation. Bis(4-((chloro substituted phenyl)azo)anilino methylenes. 4,562,249, Cl. 534-641.000.
Schwirtlich, Ingo; Woditsch, Peter; and Koch, Wolfgang, to Bayer Aktiengesellschaft. Process for the production of coarsely crystalline silicon. 4,561,930, Cl. 156-616.00R.
SCM Corporation: *See—*
Blanchard, Raymond A., Jr., 4,561,793, Cl. 400-697.100.
Herzing, Anthony G., 4,562,079, Cl. 426-94.000.
Scrantom, Dehart G.; and Hopkins, Lonnie, to AVX Corporation. Method of applying terminations to ceramic bodies. 4,561,954, Cl. 204-192.00R.
Sedivec, Darrel F., to Sanders Associates, Inc. Transition from stripline to waveguide. 4,562,416, Cl. 333-26.000.
Seino, Kazuyuki: *See—*
Kamohara, Eiji; and Seino, Kazuyuki, 4,562,377, Cl. 313-402.000.
Sekigami, Kazuo: *See—*
Iwata, Hiroshi; Takebayashi, Masahiro; Sakazume, Akio; Uneyama, Yoshihisa; Sekigami, Kazuo; Tagawa, Shigetaro; and Sugiyama, Masahiko, 4,561,829, Cl. 417-368.000.
Sekiguchi, Shizuo; Kitano, Kyozo; and Nagano, Katsumasa, to Lion Corporation. Surfactant composition. 4,561,999, Cl. 252-557.000.
Sekler, Jorg; Zumsteg, Alphonse E.; and Hintermann, Hans Erich, to Laboratoire Suisse de recherches Horlogeres. Piezoelectric contamination detector. 4,561,286, Cl. 73-23.000.
Sekozawa, Teruji: *See—*
Miyaoka, Shinichiro; Sekozawa, Teruji; Funabashi, Motohisa; and Hayashi, Shinobu, 4,562,552, Cl. 364-510.000.
Senapati, Nagabhusan: *See—*
Muralidhara, Harapanahalli; Parekh, Bhupendra; and Senapati, Nagabhusan, 4,561,953, Cl. 204-182.300.
Sencore, Inc.: *See—*
Graham, Timothy J., 4,562,469, Cl. 358-139.000.
Sendo, Takashi: *See—*
Asaoka, Sachio; Sendo, Takashi; and Nakamura, Munekazu, 4,562,059, Cl. 423-626.000.
Sengupta, Sisir K. Method and composition for treating cancer. 4,562,176, Cl. 514-17.000.

Senstar Security Systems Corp.: *See—*
Harman, R. Keith; and Younge, Dale R., 4,562,428, Cl. 340-552.000.

Sepp, Walter E., to RCA Corporation. Circuit for coupling a three terminal filter to a signal path using one interface connection. 4,562,458, Cl. 358-21.00R.

Sestak, Joseph T.; and Kagan, Jonathan, to American Sterilizer Company. Indicator seal and sterilizer container. 4,562,047, Cl. 422-300.000.

Sestini, Grazia: *See—*
Del Vecchio, Alfonso; and Sestini, Grazia, 4,562,287, Cl. 562-492.000.

Setala, Pekka T.: *See—*
Makipirtti, Simo A. I.; and Setala, Pekka T., 4,561,884, Cl. 75-21.000.

Seymour, Shaun A., to Sperry Corporation. Agricultural feed blending apparatus. 4,561,781, Cl. 366-132.000.

Shafritz, David A., to Albert Einstein College of Medicine, A Division of Yeshiva Univ. Diagnostic test for hepatitis B virus. 4,562,159, Cl. 436-501.000.

Shapland, James T., to Flo-Con Systems, Inc. Valve and replaceable collector nozzle. 4,561,573, Cl. 222-600.000.

Sharp, H. Eugene; and Smither, Miles A., to NL Sperry Sun, Inc. Borehole acoustic telemetry system with phase shifted signal. 4,562,559, Cl. 367-82.000.

Sharp Kabushiki Kaisha: *See—*
Kawano, Tadaaki; and Nishida, Takashi, 4,561,755, Cl. 355-3.0SH.
Kawano, Tadaaki; Ito, Keizo; and Nishida, Takashi, 4,561,760, Cl. 355-3.00R.

Shauger, Herbert A., to Fischer & Porter Company. Computer data bus compatible current and frequency output system. 4,562,547, Cl. 364-484.000.

Shaver, Marvin B.; and Guerguerian, Rhual L., to Dominion Engineering Works Limited. Mill load sensing system. 4,561,599, Cl. 241-34.000.

Shaw, James E.; and Pardue, Jerry E., to Phillips Petroleum Company. Surfactant oil recovery systems and recovery of oil therewith. 4,561,501, Cl. 166-273.000.

Shaw, Randall C.: *See—*
Benz, Frank J.; Shaw, Randall C.; and Dixon, David S., 4,561,784, Cl. 374-8.000.

Shell Austria Aktiengesellschaft: *See—*
Schlosser, Viktor, 4,561,171, Cl. 29-572.000.

Shell Oil Company: *See—*
Drent, Eit, 4,562,284, Cl. 562-406.000.
Kamp, Anthony W., 4,562,560, Cl. 367-83.000.
Wood, Donald L.; and Wood, Donald C., 4,561,933, Cl. 162-5.000.

Shepherd, Charles G.; and Chapman, David, to Chas. Chapman Company Limited, The. Book holder. 4,561,623, Cl. 248-447.000.

Sherwin-Williams Company, The: *See—*
Mels, Sherman J.; Petrie, Brian C.; and Pokusa, Richard J., 4,561,952, Cl. 204-181.700.

Shibata, Haruo, to Tokyo Shibaura Denki Kabushiki Kaisha. Loading-/ejecting device for a magnetic disk. 4,562,498, Cl. 360-97.000.

Shibata, Yoshiaki: *See—*
Nakamura, Norihiko; Baika, Toyokazu; Shibata, Yoshiaki; and Miki, Toshio, 4,561,390, Cl. 123-90.150.

Shida, Atsuhiko: *See—*
Shimano, Shizuo; Kobayashi, Shinichi; Yanagi, Mikio; Yamada, Osamu; Shida, Atsuhiko; and Futatsuya, Fumio, 4,561,880, Cl. 71-92.000.

Shida, Takafumi: *See—*
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizu, Susumu; Watanabe, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,561,877, Cl. 71-90.000.

Shidner, Morris C. Utility bag with sustained open configuration. 4,561,525, Cl. 190-106.000.

Shigemitsu, Hideyuki, to Mitsubishi Rayon Co., Ltd. Polyamide resin composition excellent in plate adhesion. 4,562,221, Cl. 524-456.000.

Shikano, Tohru; Ogasawara, Terumi; and Arai, Masayuki, to Asahi Seimitsu Kabushiki Kaisha. Automatic diaphragm control device for use IWT CCTV camera. 4,562,476, Cl. 358-228.000.

Shikano, Tohru: *See—*
Ogasawara, Terumi; Arai, Masayuki; and Shikano, Tohru, 4,562,477, Cl. 358-228.000.

Shilston, Norman L.: *See—*
Clapp, Craig S. K.; Shilston, Norman L.; Jolivet, Jean-Claude R.; Devimeux, Daniel P.; and Riou, Armand, 4,562,466, Cl. 358-133.000.

Shimano Industrial Company Limited: *See—*
Matsushima, Shiro, 4,561,604, Cl. 242-84.20R.
Nakajima, Hideki, 4,561,605, Cl. 242-84.52B.

Shimano, Shizuo; Kobayashi, Shinichi; Yanagi, Mikio; Yamada, Osamu; Shida, Atsuhiko; and Futatsuya, Fumio, to Nippon Kayaku Kabushiki Kaisha. 1H[1,2,4]-Triazolo[1,2-a]pyridazine-1,3-diones useful as herbicides. 4,561,880, Cl. 71-92.000.

Shimazaki, Norihiko: *See—*
Teraji, Tsutomu; Todo, Eishiro; Shimazaki, Norihiko; Oku, Teruo; and Namiki, Takayuki, 4,562,179, Cl. 514-77.000.

Shimizu, Sakayu: *See—*
Shiozaki, Shozo; Yamada, Hideaki; Tani, Yoshiki; and Shimizu, Sakayu, 4,562,149, Cl. 435-88.000.

Shimizu, Shigemi, to Sanden Corporation. Lubricating mechanism for a scroll-type fluid displacement apparatus. 4,561,832, Cl. 418-55.000.

Shimizu, Susumu: *See—*
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizu, Susumu; Watanabe, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,561,877, Cl. 71-90.000.

Shimizu, Toshio; Satou, Takanori; Tsukui, Tsutomu; Doi, Ryouta; and Yamaguchi, Motoo, to Hitachi, Ltd. Liquid fuel cell. 4,562,123, Cl. 429-27.000.

Shimogawa, Toshiaki: *See—*
Sakakibara, Kazuo; Shimogawa, Toshiaki; Kato, Masahiko; and Matsuoka, Fumio, 4,561,606, Cl. 242-107.000.

Shin-Etsu Chemical Co., Ltd.: *See—*
Kondo, Kiyohiro; Sugawara, Hiroshi; and Hasebe, Nobuyuki, 4,562,238, Cl. 528-18.000.

Shin, Yong W.; Wiedermann, Arne H.; and Ockert, Carl E., to United States of America, Energy. Shock wave absorber having apertured plate. 4,562,036, Cl. 376-283.000.

Shinagawa Machinery Works Co., Ltd.: *See—*
Zaitu, Eizo, 4,561,347, Cl. 99-352.000.

Shinjo, Goro; Makita, Mitsuyasu; and Tsuda, Shigenori, to Sumitomo Chemical Company, Limited. Insecticidal composition comprising synergistic combinations of 3-(2-methoxyphenyl)-5-methoxy-1,3,4-oxadiazol-2(3H)-one and pyrethroid type compounds. 4,562,062, Cl. 424-45.000.

Shinjo, Tuneo; Nakamura, Yoshiharu; and Chikaraishi, Takayo, to Nissan Motor Company, Limited. Body structure of automotive vehicle having front swinging door and rear sliding door and having no pillar between front and rear doors. 4,561,690, Cl. 296-155.000.

Shinkawa, Hiroyasu: *See—*
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizu, Susumu; Watanabe, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,561,877, Cl. 71-90.000.

Shinohara, Kunio: *See—*
Hatakenaka, Toshiki; Akiyama, Tetsuo; Asada, Shinji; and Shinohara, Kunio, 4,561,800, Cl. 404-79.000.

Shinohara, Yoshitsugu: *See—*
Ohmae, Kenichi; Tateisi, Kazuma; Shinohara, Yoshitsugu; and Ichihashi, Masazumi, 4,562,341, Cl. 235-379.000.
Tateisi, Kazuma; and Shinohara, Yoshitsugu, 4,562,340, Cl. 235-379.000.

Shiokawa, Hiroyuki: *See—*
Hiraishi, Hisashi; Nishihara, Hisakatsu; and Shiokawa, Hiroyuki, 4,561,890, Cl. 75-125.000.

Shiokawa, Yoshiro, to Anelva Corporation. Analyzing apparatus capable of analyzing a surface at a high resolution. 4,562,352, Cl. 250-305.000.

Shionogi & Co., Ltd.: *See—*
Adachi, Ikuo; Yamamori, Teruo; Ueda, Motohiko; and Doteuchi, Masami, 4,562,256, Cl. 546-120.000.

Shiota, Masahiko: *See—*
Oaku, Takaaki; Hokazono, Yasuzi; Shiota, Masahiko; and Maki, Yoshihiro, 4,561,889, Cl. 75-125.000.

Shiozaki, Shozo; Yamada, Hideaki; Tani, Yoshiki; and Shimizu, Sakayu, to Nippon Zeon Co., Ltd. Yeast culture containing S-adenosyl methionine in high concentrations, and process for production of S-adenosyl methionine. 4,562,149, Cl. 435-88.000.

Shirts, Monte B.; Martin, Dale A.; and Petersen, Allan E., to United States of America, Interior. Recovery of titanium from perovskite by acid sulfation. 4,562,049, Cl. 423-82.000.

Shoji, Futoshi: *See—*
Nakamoto, Hiromasa; Natsuaki, Yukinobu; Michihira, Osamu; and Shoji, Futoshi, 4,561,527, Cl. 192-4.00C.

Shores, Marvin W., to General Dynamics Pomona Division. Tracing aid for computer graphics. 4,561,183, Cl. 33-1.00M.

Shoup, Thomas E., to TRW Inc. Stud welding tool. 4,562,328, Cl. 219-98.000.

Sidley Diamond Tool Company: *See—*
Steyskal, Rex F., 4,561,217, Cl. 51-168.000.

Siebke, Hans: *See—*
Jahnke, Horst; Moro, Brigitte; Scholz, Erich; and Siebke, Hans, 4,562,431, Cl. 340-604.000.

Siemens Aktiengesellschaft: *See—*
Acke, Edgar, 4,561,716, Cl. 339-177.00R.
Behrens, Martin; and Stoberl, Walter, 4,561,792, Cl. 400-618.000.
Gobel, Herbert; and Kopl, Rupert, 4,562,585, Cl. 378-83.000.
Hetz, Walter, 4,561,446, Cl. 128-660.000.
Hieber, Konrad; and Mayer, Norbert, 4,562,089, Cl. 427-10.000.
Kerscher, Max; and Kroning, Armin, 4,562,383, Cl. 315-225.000.
Klamt, Manfred, 4,562,527, Cl. 363-89.000.
Knott, Joseph, 4,561,759, Cl. 355-3.0DD.
Kopetzky, Horst; Nagler, Werner; and Ossler, Walter, 4,562,308, Cl. 179-18.0FA.
Pospischil, Reginhard, 4,562,422, Cl. 340-347.0DD.
Preuss, Bernhard; and Manthe, Karl-Heinz, 4,562,419, Cl. 335-195.000.
Rogler, Wolfgang; Markert, Helmut; Kretzschmar, Klaus; and Piecha, Gerhard, 4,562,227, Cl. 524-786.000.
Ziegler, Alfred, 4,562,401, Cl. 324-52.000.

Siemens Eammasonics, Inc.: *See—*
Del Medico, Anthony P., 4,562,353, Cl. 250-363.00S.

SIG Schweizerische Industrie Gesellschaft: *See—*
Grundler, Bruno, 4,561,572, Cl. 222-410.000.

Siliconix Incorporated: *See—*
Pitzer, Dorman C.; and Rice, Edward J., 4,561,168, Cl. 29-571.000.

Silver Seiko Ltd.: *See*—
Nagashima, Yoshimitsu, 4,561,791, Cl. 400-208.000.
Silverstein, Paul: *See*—
McKnight, James T.; and Silverstein, Paul, 4,561,435, Cl. 128-156.000.
Silvestri, George, Jr., to Westinghouse Electric Corp. Power plant feedwater system. 4,561,255, Cl. 60-678.000.
Simko, Aladar O., to Ford Motor Company. Four valve for cylinder engine with single overhead camshaft. 4,561,391, Cl. 123-90.270.
Simon-Johnson, Inc.: *See*—
Bonuchi, James A.; and Criscione, Frank J., II, 4,561,148, Cl. 17-11.000.
Simons, Peter W., to Orbital Engine Company Proprietary Limited. Control of fuel injection apparatus for internal combustion engines. 4,561,405, Cl. 123-531.000.
Simons, Stephen W. Motorcycle fork. 4,561,669, Cl. 280-276.000.
Simshauser, Elvin D., to RCA Corporation. Stylus lapping control. 4,561,215, Cl. 51-165.750.
Sinclair, Ronald R.; and Nussdorfer, Theodore J., to Sanders Associates, Inc. Infrared target seeker for spinning projectile. 4,561,611, Cl. 244-3.160.
Singer Company, The: *See*—
Ljung, Bo H. G.; and Cohen, Hyman, 4,561,780, Cl. 356-350.000.
Singhal, Gopal H.; Colle, Karla S.; Edelson, Edward H.; Wilson, Bobby L.; and Dao, Loan H., to Exxon Research and Engineering Co. Catalyst for the hydroconversion of carbonaceous materials. 4,561,964, Cl. 208-10.000.
Sintokogio Ltd.: *See*—
Uzaki, Nagato; Kawamura, Yasutaro; Kanayama, Ryoji; and Harada, Hisashi, 4,561,485, Cl. 164-201.000.
Siwersson, Olle L.; Wall, Arne E.; and Kristensson, Kent B. G., to AB Scaniainventor. Apparatus for spreading granular material. 4,561,596, Cl. 239-687.000.
Sjogren, Christer A.; McRae, John; and Reyes, Carlos, to Quipp, Incorporated. Inserted product newspaper sensor. 4,562,339, Cl. 235-98.00R.
Skarvada, Thomas, to Crane Co. Modulator for anti-skid braking system. 4,562,542, Cl. 364-426.000.
Skerjanec, Joze; and Pocivalnik, Stane, to Gorenje Tovarna Gospodinjake Opreme N.Sol. O. Velenje. Foil welding device. 4,561,925, Cl. 156-379.600.
Skoda, koncernova podnik: *See*—
Altmann, Josef; and Ratislav, Jaromir, 4,561,866, Cl. 55-166.000.
SKW Trostberg Aktiengesellschaft: *See*—
Schulze, Reinhold, 4,561,947, Cl. 204-109.000.
Slack, John D., to Rolls-Royce Limited. Investment casting. 4,561,491, Cl. 164-516.000.
Slavin, Michael; Martus, Charles R.; and Miller, Ellsworth S., to Lectron Products, Inc. Turbo boost valve. 4,561,631, Cl. 251-129.200.
Slawinski, Christopher; Doering, Robert R.; and Teng, Clarence W., to Texas Instruments Incorporated. Integrated circuit fabrication method utilizing selective etching and oxidation to form isolation regions. 4,561,172, Cl. 29-576.00W.
Slegeir, William A.; Healy, Francis E.; and Sapienza, Richard S., to United States of America, Energy. Low temperature aqueous desulfurization of coal. 4,561,859, Cl. 44-1.0SR.
Sloan-Kettering Institute: *See*—
Real, Francisco X.; Mattes, M. Jules; Houghton, Alan N.; Livingston, Philip O.; Lloyd, Kenneth O.; Oettgen, Herbert F.; and Old, Lloyd J., 4,562,160, Cl. 436-539.000.
Slobodnik, Lev. Auto flow controller. 4,561,566, Cl. 222-56.000.
Smagiel, Gary S.: *See*—
Harter, James W.; and Smagiel, Gary S., 4,561,233, Cl. 52-588.000.
Small, Augustus B.; Hughes, Vincent L.; and Benitez, Francisco M., to Exxon Research & Engineering Co. Process for preparing light colored petroleum resins and resins produced thereby. 4,562,233, Cl. 526-76.000.
Smallwood, John W. Folder for papers. 4,561,794, Cl. 402-75.000.
Smerbeck, Richard V.; and Pittz, Eugene P., to Warner-Lambert Company. Synergistic non-steroidal anti-inflammatory compounds and compositions thereof. 4,562,194, Cl. 514-264.000.
Smetana, Klaus, to Erwin Sick GmbH Optik-Elektronik. Beam divider. 4,561,722, Cl. 350-171.000.
Smith, Charles E., to Xerox Corporation. Recirculative document duplex copying. 4,561,772, Cl. 355-14.0SH.
Smith, Charles L., to JBA Company. ATM Enclosure. 4,561,704, Cl. 312-222.000.
Smith, David W.: *See*—
Cammack, Michael A.; and Smith, David W., 4,561,593, Cl. 239-600.000.
Smith, Gary F., to General Electric Company. Copolyetherester-dimer ester-block copolymers. 4,562,232, Cl. 525-444.500.
Smith, George E. Liquid differential pressure measurement using a vertical manifold. 4,561,307, Cl. 73-438.000.
Smith, Harold A.: *See*—
Brownlie, Alan; Crawford, Jeffrey D.; and Smith, Harold A., 4,561,693, Cl. 297-306.000.
Smith, Henry I.: *See*—
Geis, Michael W.; and Smith, Henry I., 4,562,106, Cl. 428-195.000.
Smith, James J.: *See*—
Hunter, James D.; and Smith, James J., 4,561,540, Cl. 206-. .5.000.
Smith, Lyle B., to General Motors Corporation. Dual orifice control. 4,561,460, Cl. 137-493.200.
Smith, Ronald L.: *See*—
Carpenter, James H.; Mullins, Ronald L.; and Smith, Ronald L., 4,561,220, Cl. 51-427.000.
Smither, Miles A.: *See*—
Sharp, H. Eugene; and Smith, Miles A., 4,562,559, Cl. 367-82.000.
Smitherman, Robert A.; Staats, Thomas A.; and Hoover, William E. Furniture bolster. 4,561,137, Cl. 5-12.00R.
Smolka, George E.; and Alexander, Richard J., to American Maize-Products Company. Modified starch, its method of manufacture and the salad dressings produced therewith. 4,562,086, Cl. 426-578.000.
Snamprogetti, S.p.A.: *See*—
Gazzi, Luigi; D'Ambra, Roberto; Di Cintio, Roberto; Rescalli, Carlo; and Vetere, Alessandro, 4,561,869, Cl. 62-17.000.
Snarey, Michael; Swift, Peter J.; and Witty, Michael J., to Pfizer Inc. Animal growth promotant L-pyroglutamyl-pyridylalanyl-L-prolinamides. 4,562,197, Cl. 514-343.000.
Snellman, Donald L.; Kingsley, Michael L.; and Pearson, Bernard A. Sheet deflector and conveyor drive. 4,561,647, Cl. 271-296.000.
Snoe, Felix C.; and Spector, George. Soft drink can crusher. 4,561,350, Cl. 100-98.00R.
Snyder Laboratories, Inc.: *See*—
Atkinson, Robert W., 4,561,431, Cl. 128-66.000.
Sociedad Minera Pudahuel Ltda., C.P.A.: *See*—
Domic, Esteban M.; and Hein, Hans C., 4,561,887, Cl. 75-65.00R.
Societa Pneumatici Pirelli SpA: *See*—
Tavazza, Giuseppe; and Bottasso, Franco, 4,561,482, Cl. 152-381.400.
Societe Anonyme dite, Fast Lunch: *See*—
Marais, Jacques, 4,561,144, Cl. 15-302.000.
Societe Anonyme dite: Union Chimique et Industrielle de l'Quest (U.C.I.O.-S.A.): *See*—
Moran, Francis, 4,562,042, Cl. 422-13.000.
Societe de Recherches et de Developpement Industriel S.A.: *See*—
Willot, Henri, 4,561,415, Cl. 125-11.00R.
Societe d'Etudes de Machines Thermiques SEMT: *See*—
Curtil, Remi, 4,561,253, Cl. 60-606.000.
Societe Europeenne de Propulsion: *See*—
Habermann, Helmut; and Brunet, Maurice, 4,561,313, Cl. 73-862.070.
Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See*—
Bezard, Jean-Yves L. N.; Brocard, Jean-Marie; and Parisel, Christian A. F., 4,561,470, Cl. 137-625.610.
Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.": *See*—
Charbonnel, Jean-Louis, 4,561,867, Cl. 55-202.000.
Societe pour l'Etude et la Fabrication de Circuits Integres Speciaux E.F.C.I.S.: *See*—
Gris, Yvon; and Monroy, Agustin, 4,561,932, Cl. 156-643.000.
Soejima, Tetsuo: *See*—
Murano, Kazuo; Soejima, Tetsuo; and Amemiya, Shigeo, 4,562,573, Cl. 370-85.000.
Sohlstrom, Lasse, to Oy Euramechano AB. Door in a construction preventing the transition of interference fields. 4,561,209, Cl. 49-246.000.
Sokei, Hiroichi, to Hitachi, Ltd. Color television camera. 4,562,459, Cl. 358-27.000.
Solo, Alan J. Credit card provided with coded security means. 4,562,342, Cl. 235-380.000.
Sommer, Ronald G., to Miles Laboratories, Inc. Analytical element and method for preventing reagent migration. 4,562,148, Cl. 435-7.000.
Sone, Isamu: *See*—
Yamaguchi, Motoo; Sone, Isamu; Hirasawa, Kunio; Yoshioka, Yoshio; Nishikawa, Akio; Suzuki, Hiroshi; Sato, Mikio; and Hosokawa, Masao, 4,562,322, Cl. 200-148.00G.
Sony Corporation: *See*—
Amano, Yoshifumi, 4,562,434, Cl. 340-775.000.
Odaka, Kentaro; Sako, Yoichiro; Kojima, Yuichi; Nakano, Kenji; and Moriwaki, Hisayoshi, 4,562,578, Cl. 371-40.000.
Tanaka, Masato; Ohtsuki, Tadashi; and Tsuchiya, Yoshikazu, 4,562,581, Cl. 375-7.000.
Sorenson, Richard W., to Carlingswitch, Inc. Momentary switch. 4,562,318, Cl. 200-73.000.
Sorenson, Roderick J.: *See*—
Connor, David T.; and Sorenson, Roderick J., 4,562,006, Cl. 260-410.000.
Sorlien, Mark D.; and Filreis, Manuel, to Minnesota Mining and Manufacturing Company. Cable shield connector. 4,561,708, Cl. 339-14.00L.
Sotirin, Barbara: *See*—
Stixrud, Thomas E.; and Sotirin, Barbara, 4,562,554, Cl. 364-900.000.
Southwest Research Institute: *See*—
Tomlinson, Samuel J., Sr.; Dean, Edward E.; and Adams, Leon M., 4,562,212, Cl. 514-690.000.
Southwick, Theron E.; and Mitchell, John W., to G. A. Braun Inc. Wall adapter for tilt type washer-extractor machine. 4,561,268, Cl. 68-210.000.
SPA Societa Prodotti Antibiotici S.p.A.: *See*—
Bruzzese, Tiberio; Dell'Acqua, Ernani; and Van Den Heuvel, Holge: H., 4,562,203, Cl. 514-468.000.
Spaulding, Mark F.; and Goehring, Richard A., to METCO Inc. Powder feed pickup device for thermal spray guns. 4,561,808, Cl. 406-118.000.
Speck-Kolbenpumper-Fabrik Otto Speck KG: *See*—
Wolff, Horst; and Hani, Franz, 4,561,828, Cl. 417-307.000.
Spector, George: *See*—
Snoe, Felix C.; and Spector, George, 4,561,350, Cl. 100-98.00R.

Spectrolab, Incorporated: *See*—
Lawrence, Ivan R., 4,561,541, Cl. 206-332.000.
Speer, Robert J.; and Stewart, David P., to Bristol-Myers Co. Antitumor platinum complexes. 4,562,275, Cl. 556-7.000.
Speit, Burkhard: *See*—
Mennemann, Karl; Gliemeroth, Georg; Ross, Ludwig; Speit, Burkhard; Geiler, Volkmar; Krolla, Hans-Georg; and Meckel, Lothar, 4,562,161, Cl. 501-59.000.
Spence Engineering Company: *See*—
Hoffmann, Rudolf H., 4,561,458, Cl. 137-2.000.
Sperry Corporation: *See*—
Nelson, Arthur R., 4,561,718, Cl. 350-96.140.
Panuska, Brian R., 4,561,795, Cl. 403-4.000.
Seymour, Shaun A., 4,561,781, Cl. 366-132.000.
Spica S.p.A.: *See*—
Roca Nierga, Manuel, 4,561,398, Cl. 123-449.000.
Spinnler, Fritz W.: *See*—
Jaussi, Francois A.; Mayer, Andreas; and Spinnler, Fritz W., 4,561,407, Cl. 123-559.000.
Spitaler, Engelbert, to TMC Corporation. Safety ski binding. 4,561,672, Cl. 280-618.000.
Spletzer, Barry L.; and Swiatlowski, George, to Gerber Products Company. Retort crate loader and unloader. 4,561,817, Cl. 414-119.000.
Spreng, Robert R., to Briggs & Stratton Corp. Key operated shallow penetration lock. 4,561,270, Cl. 70-364.00R.
Sprenger, Willi, to General Motors Corporation. Device for securing a motor vehicle window pane. 4,561,689, Cl. 296-84.00A.
Springs Industries, Inc.: *See*—
Daniels, John Y., 4,562,107, Cl. 428-196.000.
SPS Technologies, Inc.: *See*—
Matheny, William F., III; Bernard, Clay, II; and Angell, William M., 4,561,820, Cl. 414-331.000.
Squirt & Company: *See*—
Kryger, Allen C., 4,562,087, Cl. 426-599.000.
Sremac, Steve. Voice or blow-controlled switchboard. 4,562,432, Cl. 340-706.000.
Staats, Thomas A.: *See*—
Smitherman, Robert A.; Staats, Thomas A.; and Hoover, William E., 4,561,137, Cl. 5-12.00R.
Staba, E. John; and MacCarthy, Jean J., to University of Minnesota, Regents of the. Steroidal glycosides produced by Yucca tissue culture. 4,562,250, Cl. 536-6.000.
Stageman, John F., to Imperial Chemical Industries PLC. Extraction process. 4,562,245, Cl. 528-361.000.
Stahlecker, Fritz, to Stahlecker, Hans; and Stahlecker, Fritz. Start spinning arrangement for an open end friction spinning machine. 4,561,242, Cl. 57-263.000.
Stahlecker, Hans: *See*—
Stahlecker, Fritz, 4,561,242, Cl. 57-263.000.
Staller, Siegfried: *See*—
Hempel, Hans-Ulrich; Novotny, Rudolf; Staller, Siegfried; and Kramer, Johannes, 4,561,873, Cl. 65-27.000.
Standard Textile Co., Inc.: *See*—
Taylor, Jeffrey L., 4,561,434, Cl. 128-132.00D.
Stanley, Carol A. J.; and Miller, Kim C., to Stash, Inc. Protective glove for maximized tactilegnosis. 4,561,122, Cl. 2-20.000.
Stash, Inc.: *See*—
Stanley, Carol A. J.; and Miller, Kim C., 4,561,122, Cl. 2-20.000.
Stauffer Chemical Co.: *See*—
Walker, Francis H., 4,561,876, Cl. 71-88.000.
Steele, Stanley O. Miniature wind sock assembly. 4,561,301, Cl. 73-188.000.
Steffen, Horst-Gunter: *See*—
Buchschmid, Emil; Gademann, Lothar; Hirt, Adam; Huttinger, Manfred; Jahn, Hans P.; Orova, Josef; Schmid, Hans-Dieter; and Steffen, Horst-Gunter, 4,561,410, Cl. 123-599.000.
Steinberger, Helmut; and Clarenz, Werner, to Bayer Aktiengesellschaft. Defoaming agent for plastic dispersions and disperse coating materials and its preparation. 4,562,223, Cl. 524-506.000.
Steiner, Gerd, to BASF Aktiengesellschaft. 2,3,5,6-Tetrasubstituted p-benzoquinones and their preparation. 4,562,004, Cl. 260-396.00R.
Stella, Joseph A.; and Wright, Joseph B., to Polaroid Corporation. Disk camera using single format film unit having multiple images. 4,561,742, Cl. 354-86.000.
Steltenkamp, Robert J.; Douglass, Miriam L.; and Natarelli, Gerard E., to Colgate-Palmolive Company. Stabilizing of cinnamic aldehyde-containing flavors with terpenes and sesqueterpenes. 4,562,064, Cl. 424-49.000.
Stenbock, Roger M., to Tektronix, Inc. Automatic trigger sensitivity adjustment circuit. 4,562,362, Cl. 307-290.000.
Stereographics Corp.: *See*—
Lipton, Lenny, 4,562,463, Cl. 358-88.000.
Sterling Drug Inc.: *See*—
Rogerson, Alan G., 4,562,024, Cl. 264-117.000.
Sterner, Russell L., to Kidde, Inc. Attachment jib for cranes. 4,561,552, Cl. 212-261.000.
Stevens, Floyd E.: *See*—
Tran, Ry M.; Stevens, Floyd E.; Turk, Donald L.; and Chun, Kwang S., 4,561,281, Cl. 72-389.000.
Stewart, David J. Magnetic biological device. 4,561,426, Cl. 128-1.500.
Stewart, David P.: *See*—
Speer, Robert J.; and Stewart, David P., 4,562,275, Cl. 556-7.000.
Stewart, Douglas V.; and Tabereaux, Alton T., to Reynolds Metals Company. Alumina reduction cell. 4,561,958, Cl. 204-243.00R.
Steyskal, Rex F., to Sidley Diamond Tool Company. System for precision centering a bore upon a shaft. 4,561,217, Cl. 51-168.000.
Stikvoort, Eduard F., to U.S. Philips Corporation. Digital dynamic range converter. 4,562,591, Cl. 381-106.000.
Stiles, Alvin B., to Alberta Gas Chemicals Ltd. Catalyst for the production of alkanols. 4,562,174, Cl. 502-174.000.
Stiller, Alfred H., to West Virginia University. Electrochemical neutralization of acid electrolyte. 4,561,948, Cl. 204-129.000.
Stinessen, Bernardus J.: *See*—
Arets, Jan W.; and Stinessen, Bernardus J., 4,562,563, Cl. 369-79.000.
Stirling, Irene: *See*—
Harbridge, John B.; and Stirling, Irene, 4,562,182, Cl. 514-210.000.
Stixrud, Thomas E.; and Sotirin, Barbara, to United States of America, Navy. Universal microcomputer for individual sensors. 4,562,554, Cl. 364-900.000.
Stoberl, Walter: *See*—
Behrens, Martin; and Stoberl, Walter, 4,561,792, Cl. 400-618.000.
Stock, Terence P.: *See*—
Barnard, Richard H.; and Stock, Terence P., 4,561,310, Cl. 73-861.020.
Stockmaster, Edward F.: *See*—
Richman, Lonnie J.; and Stockmaster, Edward F., 4,561,558, Cl. 220-203.000.
Stockrail Services Limited: *See*—
Duce, Edward, 4,561,359, Cl. 104-94.000.
Stoermer, Ralph T., III; and Darner, James C., to Becton, Dickinson and Company. Generation of anaerobic or microaerophilic atmosphere. 4,562,051, Cl. 423-219.000.
Storage Technology Partners: *See*—
Hug, Paul, 4,561,584, Cl. 228-19.000.
Storage Technology Partners II: *See*—
Glover, Neal; O'Keeffe, Michael J.; and Perera, S. Robert, 4,562,577, Cl. 371-38.000.
Stout, David M.; and Matier, William L., to American Hospital Supply Corporation. Aminomethyl benzanilides. 4,562,201, Cl. 514-422.000.
Stranahan, Michael: *See*—
Lew, Hyok S.; and Stranahan, Michael, 4,561,132, Cl. 4-420.000.
Strenge, Marvin L.: *See*—
Nelson, Craig E.; and Strenge, Marvin L., 4,561,285, Cl. 73-1.00B.
Stroezel, Manfred: *See*—
Laas, Harald; Tavs, Peter; Hannebaum, Heinz; and Stroezel, Manfred, 4,562,277, Cl. 556-34.000.
Stromberg, Clinton V., to American Motors Corporation. Adjustable steering column assembly and mechanism therefor. 4,561,323, Cl. 74-493.000.
Struck, Carl-Heinz; Schumacher, Ralf; Kohler, Ingomar; and Leppert, Gerd-Ullrich, to Dr. C. Otto & Comp. G.m.b.H. Transfer flue with means for improving the flow of gases. 4,561,843, Cl. 432-214.000.
Stuart, James M., to Malvern Scale Company. Torsion load cell. 4,561,511, Cl. 177-225.000.
Studt, William L.: *See*—
Kuhla, Donald E.; Studt, William L.; Campbell, Henry F.; and Yelnosky, John, 4,562,188, Cl. 514-245.000.
Stuhler, Herbert, to Hoechst Aktiengesellschaft. Process for preparing carboxylic acid esters of hexitols. 4,562,007, Cl. 260-410.600.
Stumm, Wolfgang, to Institut Dr. Friedrich Forster Prufgeratebau GmbH & Co KG. Method and apparatus for scanning the surface of an object. 4,562,349, Cl. 250-234.000.
Sturtevant-Stuart, Ronald M.: *See*—
Bond, Charles R.; and Sturtevant-Stuart, Ronald M., 4,562,495, Cl. 360-78.000.
Sudbury, Barry A.: *See*—
Choy, Clement K.; and Sudbury, Barry A., 4,561,993, Cl. 252-174.250.
Suevia Haiges GmbH & Co.: *See*—
Haiges, Adolf, 4,561,633, Cl. 251-339.000.
Sugano, Kazuhiko, to Nissan Motor Co., Ltd. Lock-up clutch control valve assembly. 4,561,528, Cl. 192-0.052.
Sugawara, Hiroshi: *See*—
Kondo, Kiyohiro; Sugawara, Hiroshi; and Hasebe, Nobuyuki, 4,562,238, Cl. 528-18.000.
Sugawara, Mitsutoshi; Tokuda, Kazuo; and Sawataishi, Tokio, to NEC Corporation. Oscillator synchronized to a pulse. 4,562,412, Cl. 331-53.000.
Sugawara, Sakuo: *See*—
Hara, Masanori; and Sugawara, Sakuo, 4,561,422, Cl. 126-110.00R.
Sugioka, Yukio; and Kono, Masami, to Kabushiki Kaisha Ishida Koki-Seisakusho. Dispersing supply apparatus in automatic weighing system. 4,561,510, Cl. 177-84.000.
Sugishita, Susumu: *See*—
Sakamaki, Hiroshi; Sugishita, Susumu; and Horikoshi, Yukio, 4,561,835, Cl. 418-173.000.
Sugita, Hiroshi: *See*—
Hiramitsu, Tetsushi; Sugita, Hiroshi; Ono, Satoshi; and Murase, Zenzaburo, 4,561,324, Cl. 74-498.000.
Sugiura, Masamichi, to Minolta Camera Kabushiki Kaisha. Control system for scanning arrangement. 4,561,764, Cl. 355-8.000.
Sugiura, Masamichi, to Minolta Camera Kabushiki Kaisha. System for controlling the reciprocation of a scanning apparatus. 4,561,771, Cl. 355-14.00R.
Sugiyama, Masahiko: *See*—
Iwata, Hiroshi; Takebayashi, Masahiro; Sakazume, Akio; Uneyama, Yoshihisa; Sekigami, Kazuo; Tagawa, Shigetaro; and Sugiyama, Masahiko, 4,561,829, Cl. 417-368.000.

Sugizaki, Iwao: *See—*
Yamamoto, Takeshi; Sakata, Hideo; and Sugizaki, Iwao, 4,561,190, Cl. 33-561.000.

Suhara, Manabu; Sajima, Yasuo; Ito, Hiroaki; and Arai, Kiyotaka, to Asahi Glass Company Ltd. Electrolytic cell for the electrolysis of an alkali metal chloride and process of using said cell. 4,561,946, Cl. 204-98.000.

Sumal, Jaihind S.; and Gneiss, Heinz, to Robert Bosch GmbH. Air flow rate meter. 4,561,302, Cl. 73-202.000.

Sumitomo Aluminium Smelting Company, Ltd.: *See—*
Yamada, Koichi; Mouri, Masahide; and Nomura, Yoshisaburo, 4,562,040, Cl. 419-23.000.

Sumitomo Chemical Company, Limited: *See—*
Nishida, Sumio; Matsuo, Noritada; Tsushima, Kazunori; Hatakoshi, Makoto; and Hirano, Masachika, 4,562,213, Cl. 514-721.000.
Ohashi, Naohito; Nagata, Shoji; and Ishizumi, Kikuo, 4,562,263, Cl. 548-479.000.
Shinjo, Goro; Makita, Mitsuyasu; and Tsuda, Shigenori, 4,562,062, Cl. 424-45.000.
Takahashi, Yukoh; Terada, Yutaka; Yachigo, Shinichi; and Ishii, Tamaki, 4,562,281, Cl. 560-104.000.

Sumitomo Heavy Industries, Ltd.: *See—*
Minegishi, Kiyoji, 4,561,833, Cl. 418-61.00B.

Sumitomo Rubber Industries, Ltd.: *See—*
Tominaga, Ichiro; and Nakahara, Akihiro, 4,561,657, Cl. 273-218.000.

Sumner, Anthony J. M., to Apsley Metals Limited. Apparatus for the manufacture of tires. 4,561,927, Cl. 156-406.200.

Sun, Ting-Zui. Roller for sugar cane squeezing mills. 4,561,156, Cl. 29-121.600.

Sunami, Hideo; Kuguminato, Hideo; Izumiyama, Yoshio; Yanagishima, Fumiya; Obara, Takashi; and Mochizuki, Kazuo, to Kawasaki Steel Corporation. Method of manufacturing T-3 grade low temper black plates. 4,561,909, Cl. 148-12.00D.

Sundstrand Corporation: *See—*
Sutrina, Thomas, 4,562,512, Cl. 361-386.000.

Sung, Rodney L.: *See—*
Davis, Marshall E.; and Sung, Rodney L., 4,561,861, Cl. 44-51.000.

Sutch, George T., to Bingham, Lawrence K., a part interest. Hay drying facility. 4,561,194, Cl. 34-229.000.

Sutrina, Thomas, to Sundstrand Corporation. Multiple semiconductor containing package having a heat sink core. 4,562,512, Cl. 361-386.000.

Suzuki, Hiroshi: *See—*
Yamaguchi, Motoo; Sone, Isamu; Hirasawa, Kunio; Yoshioka, Yoshio; Nishikawa, Akio; Suzuki, Hiroshi; Sato, Mikio; and Hosokawa, Masao, 4,562,322, Cl. 200-148.00G.

Suzuki, Kazuhiro; and Murayama, Noboru, to Ricoh Company, Ltd. Conversion of multilevel digital data to binary data. 4,562,486, Cl. 358-282.000.

Suzuki, Motoyuki: *See—*
Hosogoe, Junichi; Suzuki, Motoyuki; and Ida, Yuichi, 4,562,314, Cl. 200-5.00R.

Svyatsky, Eduard; and Rabindran, K. George, to Bell & Howell Company. Rotatable print mechanism for printing on front or back of media. 4,561,352, Cl. 101-2.000.

Swiatlowski, George: *See—*
Spletzer, Barry L.; and Swiatlowski, George, 4,561,817, Cl. 414-119.000.

Swift, Peter J.: *See—*
Snarey, Michael; Swift, Peter J.; and Witty, Michael J., 4,562,197, Cl. 514-343.000.

Swincicki, Edmund J. Container for produce, fruits groceries and the like. 4,561,554, Cl. 220-4.00F.

TAB Leasing: *See—*
Nelson, Craig E.; and Strenge, Marvin L., 4,561,285, Cl. 73-1.00B.

Tabereaux, Alton T.: *See—*
Stewart, Douglas V.; and Tabereaux, Alton T., 4,561,958, Cl. 204-243.00R.

Tabuchi, Sadao: *See—*
Arita, Yoshiumi; Katsuki, Kosuke; and Tabuchi, Sadao, 4,561,601, Cl. 242-35.50R.

Tachibana, Zenpei: *See—*
Yonehana, Kiyoshi; and Tachibana, Zenpei, 4,561,473, Cl. 139-21.000.

Tachikawa Spring Co., Ltd.: *See—*
Mouri, Hideto; and Inoue, Nobuhiro, 4,561,694, Cl. 297-379.000.
Urai, Muneharu, 4,561,917, Cl. 156-73.100.

Tadanobu, Yamazawa; and Kentaro, Inoue, to Sanyo Electric Co., Ltd.; and Tottori Sanyo Electric Co., Ltd. Gallium phosphide light-emitting diode. 4,562,378, Cl. 313-499.000.

Taga Electric Company Ltd.: *See—*
Mishiro, Shoji; and Hamada, Seiji, 4,562,413, Cl. 331-116.00R.

Tagawa, Shigetaro: *See—*
Iwata, Hiroshi; Takebayashi, Masahiro; Sakazume, Akio; Uneyama, Yoshihisa; Sekigami, Kazuo; Tagawa, Shigetaro; and Sugiyama, Masahiko, 4,561,829, Cl. 417-368.000.

Taiho Pharmaceutical Company Limited: *See—*
Micetich, Ronald G.; Yamabe, Shigeru; Tanaka, Motoaki; Kajitani, Makoto; Yamazaki, Tomio; and Ishida, Naobumi, 4,562,073, Cl. 424-114.000.

Taira, Akio: *See—*
Mihara, Shin-ichi; Imai, Toshihiro; Nakahashi, Ken-ichi; Iba, Youichi; Imaizumi, Masaki; and Taira, Akio, 4,562,344, Cl. 250-201.000.

Takada, Masazumi. Endoscope. 4,561,427, Cl. 128-4.000.

Takada, Minoru, to Honda Giken Kogyo Kabushiki Kaisha. Frame for automated two-wheel vehicles, and method for its manufacture. 4,561,670, Cl. 280-281.00R.

Takada, Toshio: *See—*
Nagai, Norimichi; Horiishi, Nanao; Kiyama, Masao; and Takada, Toshio, 4,561,988, Cl. 252-62.590.

Takagi, Katsuaki; Kita, Yuzo; Hagiwara, Yoshimune; Torii, Shuichi; and Ogawa, Kazuyoshi, to Hitachi, Ltd.; and Hitachi Microcomputer Engineering Ltd. Circuit for integrating analog signal and converting it into digital signal. 4,562,424, Cl. 340-347.0NT.

Takagi, Masashi: *See—*
Nishi, Yasuyuki; Takagi, Masashi; and Sakurai, Masao, 4,561,260, Cl. 62-115.000.

Takahashi, Isao: *See—*
Kato, Toshiyuki; Takahashi, Isao; Irie, Toshio; and Ogawa, Yozo, 4,561,910, Cl. 148-12.400.

Takahashi, Noriyoshi: *See—*
Kitabayashi, Yukio; Takahashi, Noriyoshi; Okuyama, Toshiaki; Watanabe, Masatoshi; and Ohura, Hitoshi, 4,562,397, Cl. 318-814.000.

Takahashi, Susumu: *See—*
Miyazaki, Masaru; Takahashi, Susumu; Kohashi, Takahiro; and Ueyanagi, Kiichi, 4,561,169, Cl. 29-571.000.

Takahashi, Toshikatsu; and Murata, Nobuo, to Fuji Xerox Co., Ltd. Original plate scanning device. 4,561,774, Cl. 355-75.000.

Takahashi, Yasuo: *See—*
Ichikawa, Masashi; Takahashi, Yasuo; and Saito, Tohru, 4,561,561, Cl. 220-270.000.

Takahashi, Yukoh; Terada, Yutaka; Yachigo, Shinichi; and Ishii, Tamaki, to Sumitomo Chemical Company, Limited. Production of bisphenol derivatives. 4,562,281, Cl. 560-104.000.

Takahashi, Yutaka: *See—*
Sato, Ken; Takahashi, Yutaka; Tsukaya, Takashi; Kato, Shinichi; and Hattori, Shinichiro, 4,561,429, Cl. 128-6.000.

Takajo, Shigeaki, to Kawasaki Steel Corporation. Alloy steel powder for high strength sintered parts. 4,561,893, Cl. 75-251.000.

Takami, Osamu: *See—*
Honda, Michitaka; and Takami, Osamu, 4,562,586, Cl. 378-108.000.

Takaoka, Hideo: *See—*
Yamaguchi, Isao; Sasamori, Yusuke; and Takaoka, Hideo, 4,561,770, Cl. 355-57.000.

Takasaki, Yasufumi: *See—*
Fukui, Osamu; Inuizawa, Yoshihiro; Hinenoya, Saburo; and Takasaki, Yasufumi, 4,562,230, Cl. 525-74.000.

Takasaki, Yoshiyuki: *See—*
Yamanobe, Takashi; Mitsuishi, Yasushi; and Takasaki, Yoshiyuki, 4,562,150, Cl. 435-99.000.

Takata, Mamoru: *See—*
Nakano, Jiro; Ishibashi, Takao; Akatsuka, Takao; and Takata, Mamoru, 4,561,402, Cl. 123-489.000.

Takebayashi, Masahiro: *See—*
Iwata, Hiroshi; Takebayashi, Masahiro; Sakazume, Akio; Uneyama, Yoshihisa; Sekigami, Kazuo; Tagawa, Shigetaro; and Sugiyama, Masahiko, 4,561,829, Cl. 417-368.000.

Takebe, Kaoru: *See—*
Tanaka, Susumu; and Takebe, Kaoru, 4,562,129, Cl. 430-42.000.

Takeda, Akira: *See—*
Tokumori, Yutaka; Mokuda, Osamu; Ikeda, Tadasu; Takeda, Akira; Tominaga, Masato; and Mashiba, Hiroto, 4,562,071, Cl. 424-94.000.

Takeda Chemical Industries, Ltd.: *See—*
Nojima, Shoshichi; and Nomura, Hiroaki, 4,562,005, Cl. 260-403.000.

Takeda, Yukio: *See—*
Maeda, Kunihiro; Usami, Katsuhisa; Takeda, Yukio; Ogihara, Satoru; and Asai, Osamu, 4,561,891, Cl. 75-238.000.

Takei, Shushi: *See—*
Fujioka, Yoshiharu; Onuki, Akio; and Takei, Shushi, 4,562,503, Cl. 360-123.000.

Takematsu, Noburu: *See—*
Nagamune, Teruyuki; Inoue, Ichiro; and Takematsu, Noburu, 4,561,779, Cl. 356-442.000.

Takemoto Yushi Kabushiki Kaisha: *See—*
Yamamoto, Hisao; Kimura, Fumihiko; and Ogiso, Osamu, 4,561,987, Cl. 252-8.900.

Takeuchi, Shigeru: *See—*
Sakaguchi, Keizo; and Takeuchi, Shigeru, 4,562,030, Cl. 264-173.000.

Takigawa, Nobuhiro: *See—*
Watanabe, Hideo; Hakiri, Minoru; Kawasaki, Kanjirou; Kubo, Keishi; and Takigawa, Nobuhiro, 4,562,448, Cl. 346-208.000.

Takimoto, Masatami: *See—*
Teramura, Mitsuyoshi; Takimoto, Masatami; Nakamura, Norihiko; Itoh, Takaaki; Katou, Takashi; and Isoya, Yukinori, 4,562,012, Cl. 261-44.00C.

Tamba, Shinichi; and Fukui, Noboru, to Kawasaki Jukogyo Kabushiki Kaisha. Fan housing for engine. 4,561,386, Cl. 123-41.700.

Tamura, Kunio, to Pioneer Electronic Corporation. Tracking servo system. 4,562,565, Cl. 369-44.000.

Tan, Archie; and Fencl, Vernon R., to Grotnes Metalforming Systems, Inc. Machine for welding automotive wheel rim blanks. 4,562,326, Cl. 219-59.100.

Tanahashi, Ichiroh: *See—*
Nishino, Atsushi; Yoshida, Akihiko; and Tanahashi, Ichiroh, 4,562,511, Cl. 361-324.000.

Tanaka, Hidetoshi: *See*—
Aoki, Tomohiro; and Tanaka, Hidetoshi, 4,561,767, Cl. 355-26.000.
Tanaka, Hiromichi; Kimura, Hiroyuki; Noda, Tsutomu; Arai, Takao; Kobayashi, Masaharu; and Inoue, Shigeki, to Hitachi, Ltd. Digital player using a pulse width detector. 4,562,549, Cl. 364-486.000.
Tanaka, Kenji, to Nippon Seiko Kabushiki Kaisha. Clutch release bearing device. 4,561,788, Cl. 384-513.000.
Tanaka, Masato; Ohtsuki, Tadashi; and Tsuchiya, Yoshikazu, to Sony Corporation. Digital signal transmitting and receiving system for serial data which can be easily decoded. 4,562,581, Cl. 375-7.000.
Tanaka, Minoru, to Kabushiki Kaisha Kumahira Seisakusho. Key-exchangeable lock. 4,561,269, Cl. 70-339.000.
Tanaka, Motoaki: *See*—
Micetich, Ronald G.; Yamabe, Shigeru; Tanaka, Motoaki; Kajitani, Makoto; Yamazaki, Tomio; and Ishida, Naobumi, 4,562,073, Cl. 424-114.000.
Tanaka, Motoharu: *See*—
Machida, Hazime; and Tanaka, Motoharu, 4,562,105, Cl. 428-161.000.
Tanaka, Sotaro: *See*—
Aoyagi, Yukio; Izumi, Eiki; Yamaguchi, Takeshi; and Tanaka, Sotaro, 4,561,250, Cl. 60-430.000.
Tanaka, Susumu; and Takebe, Kaoru, to Minolta Camera Kabushiki Kaisha. Method of forming monochromatic or dichromatic copy images. 4,562,129, Cl. 430-42.000.
Tandon Corporation: *See*—
Bygdnes, Perry A., 4,562,500, Cl. 360-105.000.
Tani, Hideo: *See*—
Hashimoto, Masahiro; and Tani, Hideo, 4,561,863, Cl. 51-295.000.
Tani, Katsya: *See*—
Yamane, Noriomi; Arimatsu, Yoshikazu; Katsuo, Kenichi; Saitoh, Minoru; Tani, Katsya; Mitamura, Hideyuki; and Hiroyoshi, Kamatani, 4,562,239, Cl. 528-65.000.
Tani, Yoshiki: *See*—
Shiozaki, Shozo; Yamada, Hideaki; Tani, Yoshiki; and Shimizu, Sakayu, 4,562,149, Cl. 435-88.000.
Taniguchi, Kiyoshi: *See*—
Ueda, Ikuo; Taniguchi, Kiyoshi; and Katsura, Yousuke, 4,562,190, Cl. 514-254.000.
Taniguchi, Matsuyoshi, to Dainippon Screen Mfg. Co., Ltd. Apparatus for placing a board into an upright state. 4,561,535, Cl. 198-406.000.
Tanikawa, Keiichi; Fujii, Masahiro; and Kanno, Hideo, to Nippon Steel Corporation. Aqueous solution for cooling cold-rolled steel strip in a continuous annealing process. 4,561,911, Cl. 148-18.000.
Tanikawa, Kunihiro; and Ohtsuki, Osamu, to Fujitsu Limited. Charge coupled device having meandering channels. 4,562,452, Cl. 357-24.000.
Tanizawa, Tetsu, to Fujitsu Limited. TTL Circuit in which transient current is prevented from flowing therethrough. 4,562,364, Cl. 307-454.000.
Tapner, Peter N.: *See*—
Corbett, John; Brown, Edric M. E.; Tapner, Peter N.; and Commander, David J., 4,561,367, Cl. 112-38.000.
Tarumi, Noriyoshi; Iwahashi, Haruo; Matsunawa, Masahiko; and Tokunaga, Hiroshi, to Konishiroku Photo Industry Co., Ltd. Ion modulating electrode. 4,562,447, Cl. 346-159.000.
Tate Architectural Products, Inc.: *See*—
Gladden, Robert S., Jr.; Johnson, Richard J.; Kidd, John C.; and Younkin, Robert A., 4,561,232, Cl. 52-385.000.
Tateisi, Kazuma; and Shinohara, Yoshitsugu, to Omron Tateisi Electronics Co. Terminal device for making payments for credit transactions. 4,562,340, Cl. 235-379.000.
Tateisi, Kazuma: *See*—
Ohmae, Kenichi; Tateisi, Kazuma; Shinohara, Yoshitsugu; and Ichihashi, Masazumi, 4,562,341, Cl. 235-379.000.
Tatlow, John C.; Plevey, Raymond G.; Wotton, David E. M.; and Sargent, Colin R., to I.S.C. Chemicals Limited. Perfluoro-1-azabicyclo(5,3,0)decane compounds useful as blood substitutes. 4,562,183, Cl. 514-214.000.
Tatsuno, Kimio: *See*—
Kataoka, Keiji; Saito, Susumu; Arimoto, Akira; Hashimoto, Akira; and Tatsuno, Kimio, 4,561,717, Cl. 350-6.800.
Taub, Alan I.; Frischmann, Peter G.; and Cline, Harvey E., to General Electric Company. Stress assisted cutting of high temperature embrittled materials. 4,562,333, Cl. 219-121.0LJ.
Taubert, Hubert; and Webendoerfer, Rudolf, to Conti Fasteners AG. Method of making screws and dies therefor. 4,561,277, Cl. 72-88.000.
Tavazza, Giuseppe; and Bottasso, Franco, to Societa Pneumatici Pirelli SpA. Anti-bead unseating mounting-rim for vehicle tires. 4,561,482, Cl. 152-381.400.
Tavs, Peter: *See*—
Laas, Harald; Tavs, Peter; Hannebaum, Heinz; and Stroezel, Manfred, 4,562,277, Cl. 556-34.000.
Taylor, Derek A. Vertical axis wind turbines. 4,561,826, Cl. 416-19.000.
Taylor, James M.: *See*—
Tomlinson, Andrew; and Taylor, James M., 4,562,313, Cl. 179-175.000.
Taylor, Jeffrey L., to Standard Textile Co., Inc. Launderable cloth-like product for surgical use and method of making the same. 4,561,434, Cl. 128-132.00D.
Taylor, Roderick: *See*—
Gulley, Brian W.; Williamson, Gilbert J.; Carmichael, Richard Q.; Cooke, David F.; and Taylor, Roderick, 4,561,860, Cl. 44-10.00R.
TDK Corporation: *See*—
Ezaki, Joichiro; Kanai, Hiroshi; and Kitabara, Yoshimi, 4,562,502, Cl. 360-114.000.
Tecnoma: *See*—
Ballu, Patrick J. M., 4,561,591, Cl. 239-159.000.
Teetz, Volker: *See*—
Urbach, Hansjorg; Henning, Rainer; Teetz, Volker; Wissmann, Hans; and Becker, Reinhard, 4,562,202, Cl. 514-423.000.
Tegeler, John J.; and Diamond, Craig J., to Hoechst-Roussel Pharmaceuticals Inc. (1,2,4-Oxadiazol-3-yl)arylmethanones, compositions and pharmaceutical use. 4,562,186, Cl. 514-238.000.
Tegeler, John J.; and Diamond, Craig J., to Hoechst-Roussel Pharmaceuticals Inc. (Isoxazol-3-yl)arylmethanones, compositions and pharmaceutical use. 4,562,187, Cl. 514-238.000.
Tektronix, Inc.: *See*—
Irvin, Darrell B., 4,562,402, Cl. 328-63.000.
Jones, Roydn; Dagostino, Thomas P.; and Navarro, Luis J., 4,562,363, Cl. 307-351.000.
Pak, Jungho; and Navia, Jaime A., 4,562,480, Cl. 358-248.000.
Stenbock, Roger M., 4,562,362, Cl. 307-290.000.
Tran, Ry M.; Stevens, Floyd E.; Turk, Donald L.; and Chun, Kwang S., 4,561,281, Cl. 72-389.000.
Teledyne Industries, Inc.: *See*—
Cammack, Michael A.; and Smith, David W., 4,561,593, Cl. 239-600.000.
Teng, Clarence W.: *See*—
Slawinski, Christopher; Doering, Robert R.; and Teng, Clarence W., 4,561,172, Cl. 29-576.00W.
Tenjinbayashi, Koji: *See*—
Kohno, Tsuguo; Yoshida, Yoshitaro; Tenjinbayashi, Koji; and Okazaki, Yuichi, 4,561,333, Cl. 82-1.00C.
Tenn, Faozy E., to Nabisco Brands, Inc. Fruit filler for pastry products and process for its preparation. 4,562,080, Cl. 426-94.000.
Terada, Yutaka: *See*—
Takahashi, Yukoh; Terada, Yutaka; Yachigo, Shinichi; and Ishii, Tamaki, 4,562,281, Cl. 560-104.000.
Teraji, Tsutomu; Todo, Eishiro; Shimazaki, Norihiko; Oku, Teruo; and Namiki, Takayuki, to Fujisawa Pharmaceutical Co., Ltd. Phospholipid derivatives, and pharmaceutical composition of the same. 4,562,179, Cl. 514-77.000.
Teramura, Mitsuyoshi; Takimoto, Masatami; Nakamura, Norihiko; Itoh, Takaaki; Katou, Takashi; and Isoya, Yukinori, to Toyota Jidosha Kabushiki Kaisha; and Aisan Industry Co., Ltd. Variable venturi type carburetor. 4,562,012, Cl. 261-44.00C.
Terano, Minoru; Kimura, Kouhei; Murai, Atsushi; Inoue, Masuo; and Miyoshi, Katsuyoshi, to Toho Titanium Co., Ltd. Catalyst component for the polymerization of olefins and catalyst therefor. 4,562,173, Cl. 502-127.000.
Termofrost Sweden AB: *See*—
Lindgren, Bengt, 4,562,509, Cl. 361-104.000.
Terreault, Gerard: *See*—
Dinh, Chom T. L.; Garceau, Roger; Pastor, Marc; and Terreault, Gerard, 4,562,470, Cl. 358-167.000.
Tessier, Jean: *See*—
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,562,282, Cl. 560-184.000.
Te Velde, Ties S., to U.S. Philips Corporation. Method of manufacturing a wiring system. 4,561,173, Cl. 29-577.00C.
Tevopharm Schiedam B.V.: *See*—
Van Maanen, Johannes D., 4,561,237, Cl. 53-548.000.
Tews, Paul: *See*—
Pavelic, Vjekoslav; and Tews, Paul, 4,561,914, Cl. 148-26.000.
Texaco Inc.: *See*—
Darden, Jerome W., 4,561,990, Cl. 252-75.000.
Davis, Marshall E.; and Sung, Rodney L., 4,561,861, Cl. 44-51.000.
Long, Stephen L.; and Cheung, Yin L., 4,561,785, Cl. 374-42.000.
Texas Instruments Incorporated: *See*—
Barnett, Howard S.; Cochran, Michael J.; and Poland, Sid, 4,562,537, Cl. 364-200.000.
Doering, Robert R.; and Armstrong, Gregory J., 4,561,170, Cl. 29-571.000.
McAdams, Hugh P., 4,561,702, Cl. 307-475.000.
McDonough, Kevin C.; Laffitte, David S.; and Hughes, John M., 4,562,435, Cl. 340-798.000.
Patrick, Thomas R.; Powell, Richard; and Berdanier, Barry N., 4,561,775, Cl. 356-5.000.
Slawinski, Christopher; Doering, Robert R.; and Teng, Clarence W., 4,561,172, Cl. 29-576.00W.
Vincent, Geoffrey P. F.; Ing-Simmons, Nicholas K. D.; McGrath, John; and Conrad, Marvin C., 4,562,535, Cl. 364-200.000.
Thaler, Heinrich: *See*—
Prager, Bernhard C.; Punk, Peter; and Thaler, Heinrich, 4,562,253, Cl. 544-19.000.
Thayer, LeRoy E.: *See*—
Lo, Peter Y. K.; Thayer, LeRoy E.; and Wright, Antony P., 4,562,096, Cl. 427-208.800.
Thelen, Robert L.: *See*—
Rouse, Michael W.; and Thelen, Robert L., 4,561,467, Cl. 137-624.180.
Theobald, Hans; Adolphi, Heinrich; and Kiehs, Karl, to BASF Aktiengesellschaft. Oxadiazolylmethylthiol phosphates as pesticides. 4,562,259, Cl. 548-112.000.
Thermo-Serv, Inc.: *See*—
Trombly, Edgar F., 4,561,562, Cl. 220-306.000.

Thiemann, Karl-Heinz; Weinert, Hans-Juergen; and Rauchle, Wilfried, to Daimler-Benz Aktiengesellschaft. Soldering foil for stress-free joining of ceramic bodies to metal. 4,562,121, Cl. 428-607.000.
Thirouard, Michel; and Arquie , Louis, to Thomson-CSF. Optical device containing a semiconductor laser. 4,562,350, Cl. 250-239.000.
Thomas, Rudolf; Draber, Wilfried; Schmidt, Robert R.; and Eue, Ludwig, to Bayer Aktiengesellschaft. Composition and method for combating weeds using an N-imidazolylmethyl halogenoacetanilide. 4,561,879, Cl. 71-92.000.
Thomas, Walter M.: *See*—
Wang, David W.; Fisher, Michael M.; and Thomas, Walter M., 4,562,246, Cl. 528-423.000.
Thompson, Albert N. Knee padding for work pants. 4,561,124, Cl. 2-23.000.
Thompson, Bradley G.; and Jack, Thomas R., to Nova/Husky Research Corporation Ltd. Method of enhancing oil recovery by use of exopolymer-producing micro-organisms. 4,561,500, Cl. 166-246.000.
Thompson, Kevin R., to Abbott Laboratories. Protective enclosure for liquid-containing pouches. 4,561,543, Cl. 206-523.000.
Thompson, Richard J.: *See*—
Hoffmeister, Lawrence D.; Madderra, Jimmy M.; and Thompson, Richard J., 4,561,568, Cl. 222-130.000.
Thompson, William L.: *See*—
Keyes, Marion A., IV; and Thompson, William L., 4,561,311, Cl. 73-861.220.
Thomsen, Torben H., to Dalso Maskinfabrik AF 1976 A/S. Woodburning stove, fireplace or the like. 4,561,420, Cl. 126-77.000.
Thomsen, Uwe H.: *See*—
Klocke, Harald; and Thomsen, Uwe H., 4,561,344, Cl. 91-358.00A.
Thomson-CSF: *See*—
Beal, Gerard; and Coutures, Jean-Louis, 4,562,417, Cl. 333-165.000.
Bricot, Claude; Berthet, Pierre; and Gerard, Jean-Louis, 4,562,564, Cl. 369-44.000.
Bursztejn, Jacques; and Babany, Lucien, 4,562,307, Cl. 179-2.00E.
Deman, Pierre; and Potage, Jean, 4,562,571, Cl. 370-7.000.
Elcrin, Alain; and Chambron, Edmond, 4,561,798, Cl. 403-109.000.
Eouzan, Jean Y.; and Boyer, Robert, 4,562,471, Cl. 358-172.000.
Thirouard, Michel; and Arquie , Louis, 4,562,350, Cl. 250-239.000.
Thomson-CSF Telephone: *See*—
Le Creff, Michel; Guillou, Francoise; and Buhagiar, Francois, 4,562,309, Cl. 179-90.00R.
Thomson, Matthew W. S.: *See*—
Goldman, Stuart O.; Lissakers, Erik A.; and Thomson, Matthew W. S., 4,562,572, Cl. 370-80.000.
Thorogood, Peter B.; and Vinter, Jeremy G. Imidazole derivatives, compositions and use. 4,562,199, Cl. 514-399.000.
Thorpe, Allan C.: *See*—
Evans, Vaughn R.; Harris, Richard H.; Thorpe, Allan C.; and Watts, John E., 4,561,790, Cl. 400-124.000.
Thys, Carl J.: *See*—
Bauer, Martin W.; Thys, Carl J.; Fredriksen, Peter A.; Robin, David J.; and Schaar, Richard J., 4,562,595, Cl. 455-345.000.
Tidwell, Doyle A. Birdhouse with cylindrical compartments. 4,561,383, Cl. 119-23.000.
Tieke, Bernd, to Ciba Geigy Corporation. Polymerisable composition comprising conjugated diacetylenic compounds, material coated therewith and the use thereof. 4,562,141, Cl. 430-281.000.
Tisserat, Craig R., to Rain Bird Consumer Products Mfg. Corp. Quick connect coupling. 4,561,682, Cl. 285-305.000.
TMC Corporation: *See*—
Spitaler, Engelbert, 4,561,672, Cl. 280-618.000.
Tobe, Akihiro: *See*—
Kikumoto, Ryoji; Tobe, Akihiro; Tonomura, Shinji; and Ikoma, Hidenobu, 4,562,211, Cl. 514-648.000.
Tobe, Seiichi: *See*—
Kameda, Eiichi; and Tobe, Seiichi, 4,562,301, Cl. 174-68.500.
Tobise, Masahiro, to Hitachi, Ltd. Insulation resistance measurement in static leonard apparatus. 4,562,390, Cl. 318-490.000.
Toda Kogyo Corporation: *See*—
Nagai, Norimichi; Horiishi, Nanao; Kiyama, Masao; and Takada, Toshio, 4,561,988, Cl. 252-62.590.
Todo, Eishiro: *See*—
Teraji, Tsutomu; Todo, Eishiro; Shimazaki, Norihiko; Oku, Teruo; and Namiki, Takayuki, 4,562,179, Cl. 514-77.000.
Togo Japan, Inc.: *See*—
Yamada, Kazuo, 4,561,514, Cl. 180-8.600.
Toho Titanium Co., Ltd.: *See*—
Terano, Minoru; Kimura, Kouhei; Murai, Atsushi; Inoue, Masuo; and Miyoshi, Katsuyoshi, 4,562,173, Cl. 502-127.000.
Tokuda, Kazuo: *See*—
Sugawara, Mitsutoshi; Tokuda, Kazuo; and Sawataishi, Tokio, 4,562,412, Cl. 331-53.000.
Tokuda, Yoshiaki: *See*—
Sakakibara, Sakuichi; Tokuda, Yoshiaki; Nagai, Tamio; Mikata, Yoshitaka; and Nishide, Kazuhiro, 4,561,509, Cl. 177-25.000.
Tokumori, Yutaka; Mokuda, Osamu; Ikeda, Tadasu; Takeda, Akira; Tominaga, Masato; and Mashiba, Hiroto, to Eisai Co., Ltd. Method of treating diabetic nephropathy. 4,562,071, Cl. 424-94.000.
Tokunaga, Hiroshi: *See*—
Tsumi, Noriyoshi; Iwahashi, Haruo; Matsunawa, Masahiko; and Tokunaga, Hiroshi, 4,562,447, Cl. 346-159.000.
Tokura, Nobuyuki; Hakamata, Yoshiro; and Oguchi, Kimio, to Nippon Telegraph & Telephone Public Corporation. Burst signal receiving apparatus. 4,562,582, Cl. 375-87.000.
Tokusima, Akira; and Inaba, Ritsuo, to Matsushita Electric Industrial Co., Ltd. Piezoelectric motor. 4,562,373, Cl. 310-328.000.
Tokyo Electric Co. Ltd.: *See*—
Kimura, Tutomu; Tsuge, Takeyoshi; Torisawa, Yoshihiro; and Makino, Ayumu, 4,562,446, Cl. 346-140.00R.
Tokyo Keiki Company Limited: *See*—
Matsushima, Yoshiaki; Chiaki, Nobutaka; Kato, Kuniaki; and Horikiri, Toshihiko, 4,561,628, Cl. 251-30.010.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Dobashi, Yoshitomi; Asakura, Masahiko; and Kohmoto, Kohtaro, 4,562,379, Cl. 313-619.000.
Fujioka, Yoshiharu; Onuki, Akio; and Takei, Shushi, 4,562,503, Cl. 360-123.000.
Kamohara, Eiji; and Seino, Kazuyuki, 4,562,377, Cl. 313-402.000.
Kurihara, Tetsuro, 4,562,464, Cl. 358-111.000.
Miyazawa, Yoshiaki, 4,562,357, Cl. 307-66.000.
Morinaga, Kaoru; Kawakami, Hiroshi; and Kotoda, Yoshihiro, 4,562,497, Cl. 360-96.300.
Nagashima, Masayoshi; and Yamane, Hiroshi, 4,562,444, Cl. 346-76.0PH.
Narabayashi, Tadashi, 4,562,584, Cl. 378-54.000.
Nawata, Yoshiaki; and Oushiden, Hideshi, 4,561,758, Cl. 355-8.000.
Okumura, Katsuya; and Miyoshi, Motosuke, 4,562,455, Cl. 357-71.000.
Shibata, Haruo, 4,562,498, Cl. 360-97.000.
Watanabe, Junji; and Nawata, Yoshiaki, 4,561,762, Cl. 355-3.00R.
Tolochko, Alexei I.: *See*—
Kudinov, Gennady A.; Kasyanov, Grigory I.; Lysenko, Evgeny E.; Tolochko, Alexei I.; Yazev, Vasily A.; and Antonov, Vladimir M., 4,561,639, Cl. 266-193.000.
Tomcufcik, Andrew S.; Meyer, Walter E.; and Tseng, Shin S., to American Cyanamid Company. Pyrazolylpiperazines. 4,562,189, Cl. 514-252.000.
Tominaga, Ichiro; and Nakahara, Akihiro, to Sumitomo Rubber Industries, Ltd. Golf ball. 4,561,657, Cl. 273-218.000.
Tominaga, Masato: *See*—
Tokumori, Yutaka; Mokuda, Osamu; Ikeda, Tadasu; Takeda, Akira; Tominaga, Masato; and Mashiba, Hiroto, 4,562,071, Cl. 424-94.000.
Tomita, Masami: *See*—
Inoue, Satoru; Uchida, Mitsuru; Yamaguchi, Kimitoshi; Aoki, Mitsuo; Tomita, Masami; and Uematsu, Chiaki, 4,562,136, Cl. 430-107.000.
Tomlinson, Andrew; and Taylor, James M., to Raychem Corporation. Electrical systems comprising temperature-sensitive devices. 4,562,313, Cl. 179-175.000.
Tomlinson, Samuel J., Sr.; Dean, Edward E.; and Adams, Leon M., to Southwest Research Institute. Method for repelling birds, especially woodpeckers. 4,562,212, Cl. 514-690.000.
Tomy Kogyo Co., Inc.: *See*—
Hamano, Nobuo; and Matsumoto, Kazumi, 4,561,723, Cl. 350-331.00R.
Tomy Kogyo Kabushiki Kaisha: *See*—
Itou, Susumu; Abe, Kishirou; and Kunou, Morishi, 4,561,275, Cl. 72-70.000.
Tong, David P. Process for the production of alginate fibre material and products made therefrom. 4,562,110, Cl. 428-284.000.
Tonnesson, Thorstein: *See*—
Wiik, Tore H.; Pettersen, Arild; and Tonnesson, Thorstein, 4,562,343, Cl. 235-382.500.
Tonomura, Shinji: *See*—
Kikumoto, Ryoji; Tobe, Akihiro; Tonomura, Shinji; and Ikoma, Hidenobu, 4,562,211, Cl. 514-648.000.
Tonus, Egidio L., to California Artichoke and Vegetable Growers Corp. Product tying machine. 4,561,234, Cl. 53-399.000.
Topfl, Werner: *See*—
Meyer, Willy; Topfl, Werner; Kristinsson, Haukur; and Eckhardt, Wolfgang, 4,562,210, Cl. 514-604.000.
Toray Industries, Inc.: *See*—
Arita, Yosihumi; Katsuki, Kosuke; and Tabuchi, Sadao, 4,561,601, Cl. 242-35.50R.
Otaki, Toshihiro; Nagata, Ryuichi; and Yoshii, Toshiya, 4,561,724, Cl. 350-334.000.
Torii, Shuichi: *See*—
Takagi, Katsuaki; Kita, Yuzo; Hagiwara, Yoshimune; Torii, Shuichi; and Ogawa, Kazuyoshi, 4,562,424, Cl. 340-347.0NT.
Torisawa, Yoshihiro: *See*—
Kimura, Tutomu; Tsuge, Takeyoshi; Torisawa, Yoshihiro; and Makino, Ayumu, 4,562,446, Cl. 346-140.00R.
Toshiba Kikai Kabushiki Kaisha: *See*—
Hashimoto, Yutaka, 4,561,462, Cl. 137-596.130.
Tottori Sanyo Electric Co., Ltd.: *See*—
Tadanobu, Yamazawa; and Kentaro, Inoue, 4,562,378, Cl. 313-499.000.
Tourneur, Christian, to Freyssinet International (STUP). Processes and devices for greasing the ends of prestress reinforcements. 4,561,226, Cl. 52-223.00L.
Townsend, Greg M., to Motorola, Inc. Method and apparatus for the selection of redundant system modules. 4,562,575, Cl. 371-9.000.
Townsend, Ray T. Skinning machine having feed device and method for using same. 4,561,150, Cl. 17-50.000.
Toyo Boseki Kabushiki Kaisha: *See*—
Yamane, Noriomi; Arimatsu, Yoshikazu; Katsuo, Kenichi; Saitoh, Minoru; Tani, Katsya; Mitamura, Hideyuki; and Hiroyoshi, Kamatani, 4,562,239, Cl. 528-65.000.
Toyo Seikan Kaisha, Ltd.: *See*—
Maruhashi, Yoshitsugu; Kano, Fumio; Yamada, Muneki; and Hirata, Sadao, 4,562,118, Cl. 428-412.000.

Toyo Soda Manufacturing Co., Ltd.: *See*—
Arika, Junji; Miyazaki, Hiroshi; Igawa, Kazushige; and Itabashi, Keiji, 4,562,055, Cl. 423-329.000.
Toyoda Gosei Co., Ltd.: *See*—
Hiramitsu, Tetsushi; Sugita, Hiroshi; Ono, Satoshi; and Murase, Zenzaburo, 4,561,324, Cl. 74-498.000.
Toyoda, Mitsuo: *See*—
Fujii, Etsuo; Satoh, Makoto; and Toyoda, Mitsuo, 4,561,701, Cl. 303-119.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Aoki, Masahiro; Nakamura, Junichi; Ida, Masatoshi; Oinoue, Kenichi; and Hayashi, Asao, 4,562,345, Cl. 250-201.000.
Hanaoka, Masanori, 4,561,796, Cl. 403-4.000.
Hattori, Takashi, 4,561,400, Cl. 123-478.000.
Idogaki, Takaharu; Hayashi, Ikuo; Kawai, Hisasi; Hattori, Kyo; and Sakurai, Kazuhiro, 4,561,629, Cl. 251-65.000.
Kobayashi, Nobuyuki; and Hattori, Takashi, 4,561,399, Cl. 123-478.000.
Maeda, Takao, 4,562,104, Cl. 428-148.000.
Nakamura, Norihiko; Baika, Toyokazu; Shibata, Yoshiaki; and Miki, Toshio, 4,561,390, Cl. 123-90.150.
Nakano, Jiro; Ishibashi, Takao; Akatsuka, Takao; and Takata, Mamoru, 4,561,402, Cl. 123-489.000.
Niwa, Takao; Gono, Takeshi; and Osanai, Akinori, 4,561,327, Cl. 74-866.000.
Sakakibara, Kazuo; Shimogawa, Toshiaki; Kato, Masahiko; and Matsuoka, Fumio, 4,561,606, Cl. 242-107.000.
Teramura, Mitsuyoshi; Takimoto, Masatami; Nakamura, Norihiko; Itoh, Takaaki; Katou, Takashi; and Isoya, Yukinori, 4,562,012, Cl. 261-44.00C.
Tsukamoto, Keisuk; Nagase, Masaomi; and Matsuno, Kiyotaka, 4,561,397, Cl. 123-357.000.
Toyotomi Kogyo Co., Ltd.: *See*—
Nakamura, Kazuharu; and Tsuboi, Yoshimasa, 4,561,840, Cl. 431-22.000.
Trace Systems, Inc.: *See*—
Hovey, Dean A.; Grundstrom, Douglas R.; and Yurchenco, James R., 4,562,347, Cl. 250-221.000.
Tracez, Jean C.: *See*—
Brouard, Rene A.; and Tracez, Jean C., 4,561,900, Cl. 106-246.000.
Traenckner, Hans-Joachim: *See*—
Rauleder, Gebhard; Waldmann, Helmut; Bottenbruch, Ludwig; Traenckner, Hans-Joachim; and Gau, Wolfgang, 4,562,274, Cl. 549-525.000.
Trail, George C., Jr., to Celanese Corporation. Apparatus for measuring the tension in an endless elongate member. 4,561,580, Cl. 226-45.000.
Trakas, Theodore C. Overlay for cathode ray tube display. 4,562,481, Cl. 358-252.000.
Tramposch, Herbert, to Pitney Bowes Inc. Load cell scale of unitized construction. 4,561,512, Cl. 177-229.000.
Tran, Ry M.; Stevens, Floyd E.; Turk, Donald L.; and Chun, Kwang S., to Tektronix, Inc. Auxiliary gauging device. 4,561,281, Cl. 72-389.000.
Trans-World Manufacturing Corporation: *See*—
Franklin, Robert P., 4,561,550, Cl. 211-184.000.
Trautwein, Dieter: *See*—
Gerber, Richard; and Trautwein, Dieter, 4,562,317, Cl. 200-19.0DR.
Traversoni, Mario: *See*—
Neri, Carlo; Giroldini, Villiam; Traversoni, Mario; Guizzi, Guido; Perrotti, Emilio; and Rinaldi, Antonio, 4,562,266, Cl. 549-462.000.
Trehin, Jacques L.: *See*—
Ferry, Michel F. M. S.; and Trehin, Jacques L., 4,562,525, Cl. 363-45.000.
Treiber, Fritz F., to Hobart Corporation. Label applicator and method of label application. 4,561,921, Cl. 156-297.000.
Treiber, Helmut: *See*—
Fursich, Manfred; and Treiber, Helmut, 4,561,768, Cl. 355-38.000.
Tremain, David L.; Beach, Burt L.; and Rimington, David J., to Houdaille Industries, Inc. Liquid sight gage cover. 4,561,305, Cl. 73-323.000.
Trevarrow, David J., to Schrader Machine & Tool, Inc. Machine tool adjustment. 4,561,815, Cl. 409-227.000.
Trigent, Inc.: *See*—
Blaul, Ronald L., 4,561,903, Cl. 134-10.000.
TrioVing A/S: *See*—
Wiik, Tore H.; Pettersen, Arild; and Tonnesson, Thorstein, 4,562,343, Cl. 235-382.500.
Trisolini, George S. Self-wringing mop. 4,561,141, Cl. 15-3.000.
Troger, Wolfgang; Mesmer, Otto; and Friedrichs, Renate, to Vorwerk & Co. Interholding GmbH. Aerosol cleaning agent for textile surfaces. 4,561,992, Cl. 252-155.000.
Trombly, Edgar F., to Thermo-Serv, Inc. Contsiner and closure assembly. 4,561,562, Cl. 220-306.000.
Trubiano, Antoine, to Cari-All Inc. Safety belt for shopping cart. 4,561,676, Cl. 280-801.000.
Truman, Charles L. Folded sleeved garment. 4,561,126, Cl. 2-115.000.
Trutzschler GmbH & Co. KG: *See*—
Hosel, Fritz, 4,562,358, Cl. 307-118.000.
Schopwinkel, Theo, 4,561,151, Cl. 19-159.00R.
TRW Inc.: *See*—
Johnson, Paul H., 4,561,157, Cl. 29-148.40A.
Shoup, Thomas E., 4,562,328, Cl. 219-98.000.
Tseng, Shin S.: *See*—
Tomcufcik, Andrew S.; Meyer, Walter E.; and Tseng, Shin S., 4,562,189, Cl. 514-252.000.
Tsuboi, Yoshimasa: *See*—
Nakamura, Kazuharu; and Tsuboi, Yoshimasa, 4,561,840, Cl. 431-22.000.
Tsuchiya, Yoshikazu: *See*—
Tanaka, Masato; Ohtsuki, Tadashi; and Tsuchiya, Yoshikazu, 4,562,581, Cl. 375-7.000.
Tsuda, Hideichi: *See*—
Kawamura, Norio; Yokoe, Hifumi; and Tsuda, Hideichi, 4,561,447, Cl. 128-687.000.
Tsuda, Shigenori: *See*—
Shinjo, Goro; Makita, Mitsuyasu; and Tsuda, Shigenori, 4,562,062, Cl. 424-45.000.
Tsuda, Toshihiko: *See*—
Katsuno, Ryuji; and Tsuda, Toshihiko, 4,562,335, Cl. 219-216.000.
Tsuge, Takeyoshi: *See*—
Kimura, Tutomu; Tsuge, Takeyoshi; Torisawa, Yoshihiro; and Makino, Ayumu, 4,562,446, Cl. 346-140.00R.
Tsukada, Kazuo: *See*—
Sasaki, Shunroku; Tsukada, Kazuo; Kanzaki, Yoshiharu; and Hori, Yoshikazu, 4,562,437, Cl. 343-394.000.
Tsukamoto, Keisuk; Nagase, Masaomi; and Matsuno, Kiyotaka, to Toyota Jidosha Kabushiki Kaisha. Method of controlling individual cylinder fuel injection quantities in electronically controlled diesel engine and device therefor. 4,561,397, Cl. 123-357.000.
Tsukaya, Takashi: *See*—
Sato, Ken; Takahashi, Yutaka; Tsukaya, Takashi; Kato, Shinichi; and Hattori, Shinichiro, 4,561,429, Cl. 128-6.000.
Tsukui, Tsutomu: *See*—
Shimizu, Toshio; Satou, Takanori; Tsukui, Tsutomu; Doi, Ryouta; and Yamaguchi, Motoo, 4,562,123, Cl. 429-27.000.
Tsurukawa, Ikuya: *See*—
Ohno, Yoshimi; and Tsurukawa, Ikuya, 4,561,747, Cl. 354-402.000.
Tsushima, Kazunori: *See*—
Nishida, Sumio; Matsuo, Noritada; Tsushima, Kazunori; Hatakoshi, Makoto; and Hirano, Masachika, 4,562,213, Cl. 514-721.000.
Tsutsui, Shinji, to Canon Kabushiki Kaisha. Method of and apparatus for adsorbingly fixing a body. 4,561,688, Cl. 294-64.100.
Tucker Housewares, Inc.: *See*—
Adriaansen, David, 4,561,135, Cl. 4-572.000.
Tufts, Timothy A.: *See*—
Goel, Anil B.; and Tufts, Timothy A., 4,562,240, Cl. 528-73.000.
Turk, Donald L.: *See*—
Tran, Ry M.; Stevens, Floyd E.; Turk, Donald L.; and Chun, Kwang S., 4,561,281, Cl. 72-389.000.
Turk, Herbert; and Schiminski, Herbert, to Barmag Barmer Maschinenfabrik AG. Method and apparatus for spinning yarn and resulting yarn product. 4,561,244, Cl. 57-336.000.
Turk, Herbert: *See*—
Schippers, Heinz; Lenk, Erich; Schiminski, Herbert; and Turk, Herbert, 4,561,603, Cl. 242-43.00A.
Turner, Laurence F.; Bailey, John W.; and Parrish, Henry H., to Racal-Milgo Limited. Differential encoder and decoder for transmitting binary data. 4,562,425, Cl. 340-347.0DD.
Turner, Ralph E., Jr.: *See*—
Cook, Jerry A.; Garner, Robert H.; Turner, Ralph E., Jr.; and Bilimoria, Bomi M., 4,561,597, Cl. 241-17.000.
Tusinski, Joseph; Barnes, Brian R.; and Mathews, Herbert H., to Coburn Optical Industries, Inc. Apparatus for polishing the edges of lenses. 4,561,213, Cl. 51-105.0LG.
Tuttle, Ronald R., to Key Pharmaceuticals, Inc. Orally effective inotropic compounds. 4,562,206, Cl. 514-548.000.
Tyler, George: *See*—
Woodward, Antony I.; Tyler, George; and Lovick, John, 4,562,145, Cl. 430-538.000.
U.S.D. Corp: *See*—
Faulconer, Mark; and Langton, Allan R., 4,561,853, Cl. 441-106.000.
UBE Industries, Ltd.: *See*—
Fukui, Osamu; Inuizawa, Yoshihiro; Hinenoya, Saburo; and Takasaki, Yasufumi, 4,562,230, Cl. 525-74.000.
Yamamoto, Shinjiro; Yokoi, Shinji; Matsumoto, Keigo; Honda, Takeo; and Kobayashi, Takashi, 4,562,193, Cl. 514-358.000.
Uchida, Mitsuru: *See*—
Inoue, Satoru; Uchida, Mitsuru; Yamaguchi, Kimitoshi; Aoki, Mitsuo; Tomita, Masami; and Uematsu, Chiaki, 4,562,136, Cl. 430-107.000.
Ueda, Ikuo; Taniguchi, Kiyoshi; and Katsura, Yousuke, to Fujisawa Pharmaceutical Co., Ltd. Benzothiazolone derivatives, processes for preparation thereof and pharmaceutical compositions comprising the same. 4,562,190, Cl. 514-254.000.
Ueda, Motohiko: *See*—
Adachi, Ikuo; Yamamori, Teruo; Ueda, Motohiko; and Doteuchi, Masami, 4,562,256, Cl. 546-120.000.
Uematsu, Chiaki: *See*—
Inoue, Satoru; Uchida, Mitsuru; Yamaguchi, Kimitoshi; Aoki, Mitsuo; Tomita, Masami; and Uematsu, Chiaki, 4,562,136, Cl. 430-107.000.
Uemura, Morito; and Onodera, Kaoru, to Konishiroku Photo Industry Co., Ltd. Nitrogen-containing heterocyclic blocked mercapto development inhibitors. 4,562,138, Cl. 430-219.000.
Uetani, Kenichi: *See*—
Umeda, Yasukazu; and Uetani, Kenichi, 4,562,530, Cl. 364-148.000.

Ueyanagi, Kiichi: *See*—
Miyazaki, Masaru; Takahashi, Susumu; Kohashi, Takahiro; and Ueyanagi, Kiichi, 4,561,169, Cl. 29-571.000.

Ulicne, Joseph A.: *See*—
McFrisby, Samuel J., 4,561,665, Cl. 280-20.000.

Ullman, Myron E., Jr., to Kessler Products Co., Inc. Insert for laminated doors. 4,561,212, Cl. 49-503.000.

Umeda, Yasukazu; and Uetani, Kenichi, to Mitsubishi Denki Kabushiki Kaisha. Elevator traffic demand analyzing system. 4,562,530, Cl. 364-148.000.

Umegaki, Kikuo; and Inoue, Kotaro, to Hitachi, Ltd. Fast breeder. 4,562,034, Cl. 376-172.000.

Umino, Hiroshi: *See*—
Miyatake, Satoshi; Abe, Mitsuo; Kume, Masao; Yonemura, Shigehiro; and Umino, Hiroshi, 4,561,216, Cl. 51-165.920.

Underwood, Stephen C.; and Mullen, John T. Leaf caddy. 4,561,480, Cl. 150-49.000.

Uneyama, Yoshihisa: *See*—
Iwata, Hiroshi; Takebayashi, Masahiro; Sakazume, Akio; Uneyama, Yoshihisa; Sekigami, Kazuo; Tagawa, Shigetaro; and Sugiyama, Masahiko, 4,561,829, Cl. 417-368.000.

Union Carbide Corporation: *See*—
Glass, Joseph E., Jr., 4,561,985, Cl. 252-8.50A.
Goddard, John B.; and Merkert, Rodney F., 4,562,057, Cl. 423-409.000.
Harrison, Arnold M.; and Kaplan, Leonard, 4,562,272, Cl. 549-352.000.
McDaniel, Roger L., Jr.; Portzer, Jeffrey W.; and Zaiko, Edward J., 4,562,260, Cl. 548-141.000.
Nowobilski, Jeffert J.; and Acharya, Arun, 4,561,498, Cl. 165-160.000.
Walter, Andrew T.; Bryant, George M.; and Readshaw, Ronald L., 4,562,097, Cl. 427-209.000.

Union Oil Company of California: *See*—
Moorehead, Eric L., 4,562,269, Cl. 549-259.000.

United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Fitzgerald-Smith, James P., 4,561,376, Cl. 114-267.000.

United Kingdom of Great Britain and Northern Ireland, The Secretary of State for the Environment in Her Britannic Majesty's Government of the: *See*—
Gulley, Brian W.; Williamson, Gilbert J.; Carmichael, Richard Q.; Cooke, David F.; and Taylor, Roderick, 4,561,860, Cl. 44-10.00R.

United States of America
Agriculture: *See*—
Wilkinson, Henry T., 4,561,294, Cl. 73-73.000.
Army: *See*—
Bryant, Gordon H., 4,561,450, Cl. 128-780.000.
Hoffmeister, Lawrence D.; Madderra, Jimmy M.; and Thompson, Richard J., 4,561,568, Cl. 222-130.000.
Lebsock, Robert A., 4,561,681, Cl. 285-276.000.
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Brandt, Daniel, 4,562,334, Cl. 219-74.000.
Janoski, Edward J.; and Hollstein, Elmer J., 4,561,969, Cl. 208-262.000.
Panayotou, Nicholas F.; Green, Donald R.; and Price, Larry S., 4,562,037, Cl. 376-340.000.
Radziemski, Leon J.; and Cremers, David A., 4,561,777, Cl. 356-318.000.
Shin, Yong W.; Wiedermann, Arne H.; and Ockert, Carl E., 4,562,036, Cl. 376-283.000.
Slegeir, William A.; Healy, Francis E.; and Sapienza, Richard S., 4,561,859, Cl. 44-1.0SR.
Zeren, Joseph D., 4,561,382, Cl. 118-727.000.
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Shirts, Monte B.; Martin, Dale A.; and Petersen, Allan E., 4,562,049, Cl. 423-82.000.
National Aeronautics and Space Administration: *See*—
Benz, Frank J.; Shaw, Randall C.; and Dixon, David S., 4,561,784, Cl. 374-8.000.
Hoover, Richard B.; and Hildner, Ernest, 4,562,583, Cl. 378-43.000.
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Fletcher, Aaron N.; and Knipe, Richard H., 4,562,580, Cl. 372-69.000.
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U.S. Philips Corporation: *See*—
Arets, Jan W.; and Stinessen, Bernardus J., 4,562,563, Cl. 369-79.000.
Eisemann, Kurt, 4,562,566, Cl. 369-75.200.
Gerkema, Jan; Niessen, Anton K.; and Pelzer, Jozef B., 4,562,587, Cl. 375-133.000.
Stikvoort, Eduard F., 4,562,591, Cl. 381-106.000.
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Zandveld, Frederik; Schouten, Daniel; and van der Vliet, Peter C. L., 4,562,534, Cl. 364-200.000.

United Technologies Corporation: *See*—
Coker, Thomas G.; and La Conti, Anthony B., 4,561,945, Cl. 204-98.000.
Hovan, Edward J., 4,561,246, Cl. 60-226.100.

University of California, The Regents of the: *See*—
Hammock, Bruce D.; and Mullin, Christopher A., 4,562,292, Cl. 568-043.000.

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Green, Alex E. S.; and Green, Bruce A. S., 4,561,364, Cl. 110-347.000.

University of Minnesota, Regents of the: *See*—
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Staba, E. John; and MacCarthy, Jean J., 4,562,250, Cl. 536-6.000.

UpJohn Company, The: *See*—
Chen, Augustin T.; Onder, Kemal; and Rausch, Karl W., Jr., 4,562,228, Cl. 525-66.000.
Durvasula, Visweswara R., 4,562,271, Cl. 549-310.000.

Urai, Muneharu, to Tachikawa Spring Co., Ltd. Method of making a cushion body of synthetic resin. 4,561,917, Cl. 156-73.100.

Urbach, Hansjorg; Henning, Rainer; Teetz, Volker; Wissmann, Hans; and Becker, Reinhard, to Hoechst Aktiengesellschaft. N-Acyl hexahydroindole-2-carboxylic acids and anti-hypertensive use thereof. 4,562,202, Cl. 514-423.000.

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Maeda, Kunihiro; Usami, Katsuhisa; Takeda, Yukio; Ogihara, Satoru; and Asai, Osamu, 4,561,891, Cl. 75-238.000.

USM Corporation: *See*—
Corbett, John; Brown, Edric M. E.; Tapner, Peter N.; and Commander, David J., 4,561,367, Cl. 112-38.000.
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Usugi, Kikuo: *See*—
Koyama, Reikichi; and Usugi, Kikuo, 4,562,488, Cl. 360-8.000.

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Usui, Masayoshi; and Yonemochi, Osamu, 4,561,484, Cl. 164-101.000.

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Utagawa, Ken, to Nippon Kogaku K.K. Focus detection apparatus. 4,561,749, Cl. 354-406.000.

Uzaki, Nagato; Kawamura, Yasutaro; Kanayama, Ryoji; and Harada, Hisashi, to Sintokogio Ltd. Core making machine for making hollow core. 4,561,485, Cl. 164-201.000.

V L Churchill Limited: *See*—
Holland, Ernest, 4,561,297, Cl. 73-119.00A.

Vagan, Ferenc, to Aprillis 4. Bepipari Muvek. Cable drum. 4,561,607, Cl. 242-118.400.

Valcor Engineering Corporation: *See*—
Kreitchman, Morton A.; and Arnold, Kurt, 4,561,468, Cl. 137-625.500.

Valentin, Jean-Pascal: *See*—
Besson, Raymond J.; Boy, Jean-Jacques; and Valentin, Jean-Pascal, 4,562,375, Cl. 310-338.000.

Valentine, Joseph: *See*—
Humphreys, John K.; and Valentine, Joseph, 4,562,128, Cl. 429-178.000.

Valyocsik, Ernest W., to Mobil Oil Corporation. Synthesis of Dodecasil-1H with a methylazabicyclononanium directing agent. 4,562,166, Cl. 502-62.000.

van de Kerkhof, Lodevicus L. J., to AMP Incorporated. Apparatus for installing connectors on flat cable having automatic connector delivery system and selective orientation feature for the connectors. 4,561,178, Cl. 29-749.000.

Van Den Heuvel, Holger H.: *See*—
Bruzzese, Tiberio; Dell'Acqua, Ernani; and Van Den Heuvel, Holger H., 4,562,203, Cl. 514-468.000.

van der Lely, Ary; and Bom, Cornelis J. G., to C. van der Lely N.V. Device for spreading granular and/or powdery material. 4,561,595, Cl. 239-687.000.

van der Scheer, Derk, to Hazemeijer B.V. Current-limiting device. 4,562,320, Cl. 200-144.00R.

van der Sluys, Willem L. N., to U.S. Philips Corporation. Method of operating a bimodal heat pump and heat pump for use of this method. 4,561,259, Cl. 62-101.000.

van der Vliet, Peter C. L.: *See*—
Zandveld, Frederik; Schouten, Daniel; and van der Vliet, Peter C. L., 4,562,534, Cl. 364-200.000.

Vanderwerf, Dennis F., to Minnesota Mining and Manufacturing Company. Dual-magnification rear projection lectern. 4,561,740, Cl. 353-101.000.

Van Dorsser, William R.: *See*—
Cavalier, Robert G.; Cordi, Alexis A.; Gillet, Claude L.; Janssens de Varebeke, Philippe M.; Niebes, Paul J.; Roba, Joseph L.; Van Dorsser, William R.; Lambelin, Georges E.; and Franz, Michel R., 4,562,205, Cl. 514-546.000.

Van Hoomissen, Robert L.: *See*—
Briscoe, Terry L.; and Van Hoomissen, Robert L., 4,561,154, Cl. 24-136.00K.

Van Maanen, Johannes D., to Tevopharm Schiedam B.V. Apparatus for packing articles fed in a continuous flow. 4,561,237, Cl. 53-548.000.

Van Slooten, Marion: *See*—
Maroney, William H., 4,561,546, Cl. 209-586.000.

Van Wallaghen, Jack: *See*—
Scharboneau, Gerald L., 4,561,271, Cl. 70-399.000.

Varwig, Jurgen; Hamprecht, Gerhard; and Rohr, Wolfgang, to BASF Aktiengesellschaft. Preparation of 5-fluoro-2-phenyl-4H-3,1-benzoxazin-4-ones. 4,562,254, Cl. 544-92.000.

VDO Adolf Schindling AG: *See*—
Rub, Walter; and Bruggemann, Ulrich, 4,562,395, Cl. 318-696.000.

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Goff, Jerry K.; Marinko, Joseph A., Jr.; Venditto, Joseph G., Jr.; and Yost, Donald A., 4,562,386, Cl. 318-254.000.

Venturello, Carlo; D'Aloisio, Rino; and Ricci, Marco, to Montedison S.p.A. Peroxide composition based on tungsten and phosphorus or arsenic and processes and uses relative thereto. 4,562,276, Cl. 556-20.000.

Venturello, Carlo; and Gambaro, Mario, to Montedison S.p.A. Process for the preparation of vicinal diols soluble in water. 4,562,299, Cl. 568-811.000.

Verbatim Corporation: *See*—
Bond, Charles R., 4,562,494, Cl. 360-75.000.
Bond, Charles R.; and Sturtevant-Stuart, Ronald M., 4,562,495, Cl. 360-78.000.
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Kenan, Richard P.; and Verber, Carl M., 4,561,728, Cl. 350-356.000.

Verwijmeren, A. S.: *See*—
Halters, M. A. M.; and Verwijmeren, A. S., 4,561,348, Cl. 99-421.00H.

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Berner, Paul C., Jr.; and Brickman, Eugene L., 4,561,499, Cl. 166-85.000.

Vetere, Alessandro: *See*—
Gazzi, Luigi; D'Ambra, Roberto; Di Cintio, Roberto; Rescalli, Carlo; and Vetere, Alessandro, 4,561,869, Cl. 62-17.000.

VG Instruments Group Limited: *See*—
Atherton, Paul; Burns, Peter; and Green, Brian N., 4,562,351, Cl. 250-288.000.

Victaulic Company of America: *See*—
Kunsman, Donald R., 4,561,678, Cl. 285-39.000.

Victor Company of Japan, Limited: *See*—
Higurashi, Seiji, 4,562,492, Cl. 360-65.000.
Itoh, Kenji, 4,562,394, Cl. 318-608.000.

Viess, Walter: *See*—
Bonitz, Jorg; Entenmann, Robert; Killi, Geza; Knab, Rochus; Miller, Bernhard; Rohde, Siegfried; and Viess, Walter, 4,562,544, Cl. 364-431.110.

Vietzke, Horst; Schlich, Elmar; Luthardt, Gunther; and Huschka, Hans, to Nukem GmbH. Multiple layered transportation and storage container for radioactive wastes. 4,562,001, Cl. 252-633.000.

Villa, Jose L.; and Zeiner, Ronald N. Combined dispersant fluid loss control additives. 4,561,986, Cl. 252-8.50A.

Vince, Nigel L., to International Computers Limited. Data processing system. 4,562,539, Cl. 364-200.000.

Vincent, Geoffrey P. F.; Ing-Simmons, Nicholas K. D.; McGrath, John; and Conrad, Marvin C., to Texas Instruments Incorporated. Self-configuring digital processor system with global system. 4,562,535, Cl. 364-200.000.

Vinter, Jeremy G.: *See*—
Thorogood, Peter B.; and Vinter, Jeremy G., 4,562,199, Cl. 514-399.000.

Vita, Filippo, to Medosan Industrie Biochimiche Riunite S.p.A. Use of diethylaminoethyldextran (DEAE-D) as an antihyperinsulinemic drug. 4,562,178, Cl. 514-59.000.

Vizulis, Karlis: *See*—
von Reis, Charles; and Vizulis, Karlis, 4,561,868, Cl. 55-319.000.

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Kudinov, Gennady A.; Kasyanov, Grigory I.; Lysenko, Evgeny E.; Tolochko, Alexei I.; Yazev, Vasily A.; and Antonov, Vladimir M., 4,561,639, Cl. 266-193.000.

Voest-Alpine Aktiengesellschaft: *See*—
Laimer, Freidrich, 4,561,638, Cl. 266-158.000.
Mullner, Paul; Enkner, Bernhard; and Hubweber, Gerhard, 4,561,883, Cl. 75-10.00R.

Vogt, Hans-Joachim: *See*—
Jundt, Wolfgang; Schaal, Gunter; Schadlich, Fritz; Vogt, Hans-Joachim; and Wunsch, Steffen, 4,562,389, Cl. 318-432.000.

Vollath, Dieter: *See*—
Hrovat, Milan; Huschka, Hans; Rachor, Lothar; and Vollath, Dieter, 4,562,017, Cl. 264-0.500.

Vollkommer, Norbert: *See*—
Huber, Hans; and Vollkommer, Norbert, 4,562,225, Cl. 524-602.000.

Vollmann, William; and Mumford, Van E., to Cordis Corporation. Implantable cardiac pacer with discontinuous microprocessor programmable antitachycardia mechanisms and patient data telemetry. 4,561,442, Cl. 128-419.0PG.

Von Dach, Bernard. Method for adjusting the frequency of a piezoelectric crystal resonator. 4,562,370, Cl. 310-312.000.

von der Ohe, Manfred: *See*—
Enke, Kurt; Hespelt, Achim; Hertler, Eberhard; von der Ohe, Manfred; and Saftien, Udo, 4,561,640, Cl. 267-20.00A.

von Praun, Ferdinand: *See*—
Gude, Fritz; and von Praun, Ferdinand, 4,562,264, Cl. 549-261.000.

von Reis, Charles; and Vizulis, Karlis. Canister filter assembly. 4,561,868, Cl. 55-319.000.

Vorwerk & Co. Interholding GmbH: *See*—
Troger, Wolfgang; Mesmer, Otto; and Friedrichs, Renate, 4,561,992, Cl. 252-155.000.

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Aufderheide, Brian E., 4,562,315, Cl. 200-5.00A.

Wachi, Masatada, to Nippon Gakki Seizo Kabushiki Kaisha. Digital electronic musical instrument of pitch synchronous sampling type. 4,561,337, Cl. 84-1.010.

Wada, Takahiro; Yamamoto, Ryoichi; and Yokotani, Fumiko, to Matsushita Electric Industrial Co., Ltd. Heat storage material. 4,561,989, Cl. 252-70.000.

Waghorn, Robert D.: *See*—
Brush, Robert W., Jr.; and Waghorn, Robert D., 4,561,179, Cl. 29-866.000.

Wagner, Hans, to G. D. Searle & Co. 6-Substituted-5-phenyltetrazolo[1,5-a][1,2,4]triazole[1,5-c]pyrimidines, and pharmaceutical compositions containing them. 4,562,192, Cl. 514-258.000.

Wajs, Georges: *See*—
Bourset, Claude; and Wajs, Georges, 4,561,737, Cl. 351-160.00R.

Wakitsuka, Hirohisa; Tamato, Takashi; and Hashimoto, Shosuke, to Ono Pharmaceutical Co., Ltd. Trans-Δ^2-prostaglandin D derivatives, process for their preparation and compositions containing them. 4,562,204, Cl. 514-530.000.

Wakitani, Mitsuru: *See*—
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Waldmann, Helmut: *See*—
Rauleder, Gebhard; Waldmann, Helmut; Bottenbruch, Ludwig; Traenckner, Hans-Joachim; and Gau, Wolfgang, 4,562,274, Cl. 549-525.000.

Walker, Francis H., to Stauffer Chemical Co. Haloalkylcarbonylamino-1,3-dioxane herbicide antidotes. 4,561,876, Cl. 71-88.000.

Walker, John R.: *See*—
Herbots, Ivan; Johnston, James P.; and Walker, John R., 4,561,991, Cl. 252-118.000.

Walker, Leigh E.; and Ranade, Gautam R., to Occidental Chemical Corporation. Blends of polyolefin graft polymers and SMA polymers. 4,562,229, Cl. 525-71.000.

Walker, Leo; and Walker, Peter. Soccer training device especially for head and foot. 4,561,661, Cl. 273-411.000.

Walker, Peter: *See*—
Walker, Leo; and Walker, Peter, 4,561,661, Cl. 273-411.000.

Wall, Arne E.: *See*—
Siwersson, Olle L.; Wall, Arne E.; and Kristensson, Kent B. G., 4,561,596, Cl. 239-687.000.

Wallat, Siegfried: *See*—
Moller, Hinrich; and Wallat, Siegfried, 4,562,068, Cl. 424-70.000.

Walls, William A.: *See*—
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Walsh, David J. Light source for diagnostic test. 4,561,430, Cl. 128-6.000.

Walter, Andrew T.; Bryant, George M.; and Readshaw, Ronald L., to Union Carbide Corporation. Process of treating fabrics with foam. 4,562,097, Cl. 427-209.000.

Walter, Robert J.; Lewis, Jack R.; and Moss, Charles M., to Rockwell International Corporation. Surface crack healing with high-energy beam. 4,562,332, Cl. 219-121.0EM.

Wang, David W.; Fisher, Michael M.; and Thomas, Walter M., to American Cyanamid Company. Essentially linear, thermoplastic poly(amino-s-triazines)s and process for the production thereof. 4,562,246, Cl. 528-423.000.

Wankel, Felix. Rotary piston machine. 4,561,836, Cl. 418-183.000.

Ward, Jean R.; and Nilssen, Andrew H., to Pencept, Inc. Apparatus and method for emulating computer keyboard input with a handprint terminal. 4,562,304, Cl. 178-18.000.

Ward, Michael A. V., to Combustion Electromagnetics, Inc. Winged reentrant electromagnetic combustion chamber. 4,561,406, Cl. 123-536.000.

Ware, Robert R.: *See*—
Long, John B.; and Ware, Robert R., 4,561,425, Cl. 126-451.000.

Warnaka, Glenn E.; and Zalas, John M., to Lord Corporation. Active attenuation of noise in a closed structure. 4,562,589, Cl. 381-71.000.

Warner-Lambert Company: *See*—
Butler, Donald E.; and L'Italien, Yvon J., 4,562,195, Cl. 514-294.000.
Connor, David T.; and Sorenson, Roderick J., 4,562,006, Cl. 260-410.000.
Smerbeck, Richard V.; and Pittz, Eugene P., 4,562,194, Cl. 514-264.000.

Warner, Lucien: *See*—
Mathews, Lester R.; and Galvin, Jay, 4,561,134, Cl. 4-496.000.

Warren, James R.: *See*—
Raley, Ronald J.; and Warren, James R., 4,561,211, Cl. 49-374.000.

Wassermann, Manfred; and Liebisch, Wolfgang, to ANT Nachrichtentechnik GmbH. Automatic regulation of the output power of an amplifier. 4,562,407, Cl. 330-129.000.

Waste Recovery, Inc.: *See*—
Rouse, Michael W.; and Thelen, Robert L., 4,561,467, Cl. 137-624.180.

Watanabe, Atsumi: *See*—
Kudo, Hiroyuki; Watanabe, Atsumi; and Sasaki, Hiroshi, 4,562,507, Cl. 361-85.000.

Watanabe, Hideo; Hakiri, Minoru; Kawasaki, Kanjirou; Kubo, Keishi; and Takigawa, Nobuhiro, to Ricoh Co., Ltd. Heat-sensitive transfer medium. 4,562,448, Cl. 346-208.000.

Watanabe, Hiroshi; Izumi, Eiki; Aoyagi, Yukio; Honma, Kazuo; and Nakajima, Kichio, to Hitachi, Ltd. Control system for hydraulic circuit apparatus. 4,561,249, Cl. 60-421.000.

Watanabe, Junji; and Nawata, Yoshiaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Image forming apparatus. 4,561,762, Cl. 355-3.00R.

Watanabe, Keiichiro; Yamada, Tomiaki; Sazanami, Tsuneo; and Asahara, Eiko, to JGC Corporation; and Kansai Paint Co., Ltd.

Continuous alcohol manufacturing process using yeast. 4,562,154, Cl. 435-162.000.

Watanabe, Masatoshi: *See*—
Kitabayashi, Yukio; Takahashi, Noriyoshi; Okuyama, Toshiaki; Watanabe, Masatoshi; and Ohura, Hitoshi, 4,562,397, Cl. 318-814.000.

Watanabe, Takeo: *See*—
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizu, Susumu; Watanabe, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,561,877, Cl. 71-90.000.

Watari, Hiromichi: *See*—
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Wataya, Seiji: *See*—
Sakamoto, Yoshiyuki; and Wataya, Seiji, 4,561,396, Cl. 123-198.00E.

Water Circ.Patents, Inc.: *See*—
Mathews, Lester R.; and Galvin, Jay, 4,561,134, Cl. 4-496.000.

Water Service of America, Inc.: *See*—
Baron, Walter J., 4,561,495, Cl. 165-95.000.

Watters, James M.; and Clement, Donald E., to Northern Telecom Limited. Keyboard security for a telephone attendant console. 4,562,310, Cl. 179-100.00R.

Watts, John E.: *See*—
Evans, Vaughn R.; Harris, Richard H.; Thorpe, Allan C.; and Watts, John E., 4,561,790, Cl. 400-124.000.

Wears, Leonard. Rod bending and cutting apparatus. 4,561,279, Cl. 72-218.000.

Weatherby, David E., to Schnabel Foundation Company. Earth retaining method. 4,561,804, Cl. 405-262.000.

Weaver, Max A.; and Fleischer, Jean C., to Eastman Kodak Company. Azo dyes from unsubstituted or substituted 3-amino-pyridine and aryl or heterocyclic couplers. 4,562,248, Cl. 534-630.000.

Weaver, Richard A.; Niedzielski, James H.; and Prime, Ronald M., to Prime & Weaver Investment Company. Rotary conveyor apparatus. 4,561,536, Cl. 198-481.100.

Weaver, William R., to Libbey-Owens-Ford Company. Mold structure. 4,561,625, Cl. 249-85.000.

Webendoerfer, Rudolf: *See*—
Taubert, Hubert; and Webendoerfer, Rudolf, 4,561,277, Cl. 72-88.000.

Weber, Lothar: *See*—
Heinz, Jutta; Sautter, Helmut; Schink, Rainer; and Weber, Lothar, 4,561,729, Cl. 350-357.000.

Wedertz, Larry D.: *See*—
Maudal, Inge; Niemeier, Byron M.; and Wedertz, Larry D., 4,561,357, Cl. 102-439.000.

Weigel, Horst: *See*—
Kleemann, Axel; Martens, Jurgen; and Weigel, Horst, 4,562,152, Cl. 435-116.000.
Kleemann, Axel; Martens, Jurgen; and Weigel, Horst, 4,562,153, Cl. 435-116.000.

Weikel, Donald J., Jr.: *See*—
Salomon, James A.; and Weikel, Donald J., Jr., 4,561,757, Cl. 355-3.0BE.

Weinert, Hans-Juergen: *See*—
Thiemann, Karl-Heinz; Weinert, Hans-Juergen; and Rauchle, Wilfried, 4,562,121, Cl. 428-607.000.

Weisend, Norbert A., Jr., to B. F. Goodrich Company, The. Deicer for aircraft. 4,561,613, Cl. 244-134.00A.

Weisgerber, David J., to Omark Industries, Inc. Replaceable nose assembly for chain saw guide bar. 4,561,181, Cl. 30-387.000.

Weitz, Hans M.: *See*—
Schnabel, Rolf; and Weitz, Hans M., 4,562,283, Cl. 560-204.000.

Weldon, William F.; Gully, John H.; and Walls, William A., to Board of Regents. Brush mechanism for a homopolar generator. 4,562,368, Cl. 310-178.000.

Wella Aktiengesellschaft: *See*—
Zulauf, Karlheinz; and Egner, Rudolf, 4,561,570, Cl. 222-153.000.

Wertz, Jean-Luc H. M.; and Goffinet, Pierre C. E., to Procter & Gamble Company, The. Near-neutral pH detergents containing anionic surfactant, cosurfactant and fatty acid. 4,561,998, Cl. 252-547.000.

West Virginia University: *See*—
Stiller, Alfred H., 4,561,948, Cl. 204-129.000.

Westinghouse Electric Corp.: *See*—
Martens, Alan; Hobbs, Milton M.; and Myers, Gerald A., 4,561,254, Cl. 60-660.000.
Ruka, Roswell J., 4,562,124, Cl. 429-30.000.
Silvestri, George, Jr., 4,561,255, Cl. 60-678.000.
Zuber, Pierre A.; and Rogers, Mario, 4,562,543, Cl. 364-426.000.

Westvaco Corporation: *See*—
Schilling, Peter, 4,561,901, Cl. 106-277.000.

Wetzel, Philippe: *See*—
Marino, Jean-Claude; Marquet, Andre ; and Wetzel, Philippe, 4,561,306, Cl. 73-432.00R.

Wheeler, Robert G.; and Potts, David M., to Family Health International. Intrauterine device remover. 4,561,433, Cl. 128-130.000.

Whitley, George J., to RCA Corporation. Component lead processing apparatus. 4,561,166, Cl. 29-566.300.

Wiech, Raymond E., Jr., to Fine Particle Technology Corporation. Method of fabricating complex microcircuit boards, substrates and microcircuits and the substrates and microcircuits. 4,562,092, Cl. 427-58.000.

Wiedermann, Arne H.: *See*—
Shin, Yong W.; Wiedermann, Arne H.; and Ockert, Carl E., 4,562,036, Cl. 376-283.000.

Wiernicki, Michael V., to Ironica, Inc. Flat article conveyor. 4,561,819, Cl. 414-331.000.

Wiet, Paul: *See*—
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Wiezer, Hartmut, to Hoechst Aktiengesellschaft. Polyalkyldiazaspirodecanylacetic acid derivatives, a process for their preparation and their use as light stabilizers for organic polymers. 4,562,220, Cl. 524-95.000.

Wiggins Teape Group Limited, The: *See*—
Woodward, Antony I.; Tyler, George; and Lovick, John, 4,562,145, Cl. 430-538.000.

Wiig, Chester M., to F. J. Littell Machine Co. Strip feeders. 4,561,582, Cl. 226-142.000.

Wiik, Tore H.; Pettersen, Arild; and Tonnesson, Thorstein, to TrioVing A/S. Recodable electronic lock. 4,562,343, Cl. 235-382.500.

Wildermuth, Wallace P. Mobile-immobile safe. 4,561,362, Cl. 109-81.000.

Wilhelm Hegenscheidt Gesellschaft mbH: *See*—
Berstein, Garri, 4,561,276, Cl. 72-81.000.

Wilkinson, Christopher F.: *See*—
Rouse, David G.; and Wilkinson, Christopher F., 4,562,438, Cl. 343-17.10R.

Wilkinson, Henry T., to United States of America, Agriculture. Method and apparatus to control soil moisture matric potential. 4,561,294, Cl. 73-73.000.

Wilkinson, Maxwell; Patten, Malcolm J.; and Lee, Jeffrey H., to Dunlop Olympics Limited. Knitted sock. 4,561,267, Cl. 66-178.00A.

Wilkinson, Michael R.: *See*—
Coombes, Norman A.; Wilkinson, Michael R.; and Bromley, Charles W. A., 4,562,226, Cl. 524-767.000.

Wilkinson, William T. Exercising device for simulating climbing. 4,561,652, Cl. 272-119.000.

Willenbacher, Erich, to Pfaff Industriemaschinen GmbH. Sewing machine having the needle holder magazine with automatic coupling and decoupling of thread containing needles and needle holders. 4,561,368, Cl. 112-241.000.

Willi Studer AG: *See*—
Gaskell, Philip S.; Lagadec, Roger; and McNally, Guy, 4,562,489, Cl. 360-39.000.

William H. Rorer, Inc.: *See*—
Chou, Billy J., 4,562,209, Cl. 514-596.000.
Kuhla, Donald E.; Studt, William L.; Campbell, Henry F.; and Yelnosky, John, 4,562,188, Cl. 514-245.000.

Wm. Wrigley Jr. Company: *See*—
Arnold, Todd W.; and Patel, Mansukh M., 4,562,076, Cl. 426-5.000.

Williams, Robert L.; and Garrett, James R. Grade and slope attitude gyroscopic driven indicator for heavy earth moving equipment. 4,561,188, Cl. 33-366.000.

Williamson Corporation: *See*—
Anderson, Alan S., 4,561,786, Cl. 374-129.000.

Williamson, Gerald E., to Yetter Manufacturing Company. Hinge mechanism for folding tool bar assembly including hook engageable over pivotal connection. 4,561,505, Cl. 172-776.000.

Williamson, Gilbert J.: *See*—
Gulley, Brian W.; Williamson, Gilbert J.; Carmichael, Richard Q.; Cooke, David F.; and Taylor, Roderick, 4,561,860, Cl. 44-10.00R.

Willot, Henri, to Societe de Recherches et de Developpement Industriel S.A. Apparatus for profiling an abrasive millstone. 4,561,415, Cl. 125-11.00R.

Wilson, Bobby L.: *See*—
Singhal, Gopal H.; Colle, Karla S.; Edelson, Edward H.; Wilson, Bobby L.; and Dao, Loan H., 4,561,964, Cl. 208-10.000.

Wilson, James; and McCaffrey, David J. A., to Coal Industry (Patents) Ltd. Regenerating sorbents. 4,562,165, Cl. 502-33.000.

Wilson, Robert B., Jr.; and Laine, Richard M., to Air Products and Chemicals, Inc. Oligomerization of alkyl groups on amines. 4,562,291, Cl. 564-463.000.

Windsor, Harry M.: *See*—
Parsons, David; Windsor, Harry M.; and Comfort, John V., 4,561,530, Cl. 192-0.076.

Wingen, Peter P., to Dienes Werke fur Maschinenteille, GmbH & Co. KG. Slitting mechanism having a removable blade. 4,561,335, Cl. 83-481.000.

Winnik, Francoise M.; and Martin, Trevor I., to Xerox Corporation. Positively charged color toner compositions. 4,562,135, Cl. 430-106.000.

Winter, Roger D.; and Jennings, James K., Jr., to Samsonite Corporation. Steering and support handle for wheeled luggage. 4,561,526, Cl. 190-115.000.

Wisconsin Alumni Research Foundation: *See*—
Pavelic, Vjekoslav; and Tews, Paul, 4,561,914, Cl. 148-26.000.

Wissmann, Hans: *See*—
Urbach, Hansjorg; Henning, Rainer; Teetz, Volker; Wissmann, Hans; and Becker, Reinhard, 4,562,202, Cl. 514-423.000.

Wistar Institute of Anatomy and Biology, The: *See*—
Ricciardi, Robert P.; Barbanti-Brodano, Giuseppe; and Milanesi, Gabriele, 4,562,155, Cl. 435-172.300.

Witco Chemical Corporation: *See*—
Barker, Graham; and Barabash, Martin J., 4,562,214, Cl. 514-844.000.

Wittstein, Martin D.; and Beck, Christian A., to Pitney Bowes Inc. Toner loading apparatus. 4,561,567, Cl. 222-83.500.

Witty, Michael J.: *See*—
Snarey, Michael; Swift, Peter J.; and Witty, Michael J., 4,562,197, Cl. 514-343.000.

Woditsch, Peter: *See*—
Schwirtlich, Ingo; Woditsch, Peter; and Koch, Wolfgang, 4,561,930, Cl. 156-616.00R.

Wolf, Horst, to Zinser Textilmaschinen GmbH. Windup-control system for textile machinery. 4,562,388, Cl. 318-301.000.

Wolf, Lester C.; and Lundie, William R., to Deere & Company. Rate adjustment for chemical meter. 4,561,565, Cl. 222-28.000.

Wolfel, Werner: *See*—
Rodel, Gerhard; and Wolfel, Werner, 4,562,523, Cl. 363-21.000.

Wolff, Horst; and Hani, Franz, to Speck-Kolbenpumpen-Fabrik Otto Speck KG. Pump for forwarding liquids. 4,561,828, Cl. 417-307.000.

Womack, Robert C., to AAA Products International. Quick change latching of components. 4,561,811, Cl. 408-1.00R.

Wong, Tony C. T., to Amerigo Technology Limited. H_3PO_4/HF Siliceous formation treating composition and method. 4,561,503, Cl. 166-307.000.

Wood, Donald C.: *See*—
Wood, Donald L.; and Wood, Donald C., 4,561,933, Cl. 162-5.000.

Wood, Donald L.; and Wood, Donald C., to Shell Oil Company. Xerographics deinking. 4,561,933, Cl. 162-5.000.

Wood, Harold L., to Repco Limited. Torque wrench. 4,561,332, Cl. 81-479.000.

Wood, Sarah W., to Bactex Corporation. Method of enhancement of piliated phase of Bordetella bronchiseptica. 4,562,070, Cl. 424-92.000.

Woods, David E. Insulated cooler for beverage containers. 4,561,563, Cl. 220-412.000.

Woodward, Antony I.; Tyler, George; and Lovick, John, to Wiggins Teape Group Limited, The. Photographic base papers. 4,562,145, Cl. 430-538.000.

Wormsbacher, Wilfried: *See*—
Heimburger, Norbert; Kumpe, Gerhardt; Wormsbacher, Wilfried; and Preis, Hans M., 4,562,072, Cl. 424-101.000.

Worner, Lothar: *See*—
Gerlach, Heinz; and Worner, Lothar, 4,562,369, Cl. 310-235.000.

Worrall, George F.: *See*—
Dinnage, Derek F.; and Worrall, George F., 4,561,941, Cl. 203-24.000.

Worthington, Thomas K.: *See*—
Chainer, Timothy J.; and Worthington, Thomas K., 4,562,592, Cl. 382-3.000.

Wossner, Felix; Itzinger, Hermann; and Schopplein, Leopold, to Fichtel & Sachs AG. Method of making piston rod for shock absorbers. 4,561,164, Cl. 29-510.000.

Wotton, David E. M.: *See*—
Tatlow, John C.; Plevey, Raymond G.; Wotton, David E. M.; and Sargent, Colin R., 4,562,183, Cl. 514-214.000.

Woytiuk, Leo V.: *See*—
Checkland, John A.; and Woytiuk, Leo V., 4,562,302, Cl. 174-118.000.

Wright, Antony P.: *See*—
Lo, Peter Y. K.; Thayer, LeRoy E.; and Wright, Antony P., 4,562,096, Cl. 427-208.800.

Wright, Joseph B.: *See*—
Stella, Joseph A.; and Wright, Joseph B., 4,561,742, Cl. 354-86.000.

Wright, Robert L. Portable softball pitching mound. 4,561,653, Cl. 273-25.000.

Wrobleski, James T.; Edwards, James W.; Graham, Charles R.; Keppel, Robert A.; and Raffelson, Harold, to Monsanto Company. Process for producing maleic anhydride. 4,562,268, Cl. 549-259.000.

Wu, Shih-Jang. Exercising device. 4,561,648, Cl. 272-73.000.

Wunsch, Steffen: *See*—
Jundt, Wolfgang; Schaal, Gunter; Schadlich, Fritz; Vogt, Hans-Joachim; and Wunsch, Steffen, 4,562,389, Cl. 318-432.000.

Wurz, Norman R.: *See*—
Byczek, Roger W.; and Wurz, Norman R., 4,561,714, Cl. 339-97.00P.

Wykes, John H.; and Miller, Gerald D., to Rockwell International Corporation. Stability augmentation system for a forward swept wing aircraft. 4,562,546, Cl. 364-434.000.

Wynn, David K.: *See*—
Bachmann, Henry C.; Brown, Omar L.; Fraze, Ermal C.; Gregg, James R.; and Wynn, David K., 4,561,280, Cl. 72-346.000.

Wysocki, Lawrence S., to Champion International Corporation. Frame made from paperboard and having lockable corners. 4,561,587, Cl. 229-36.000.

Wythe Industries Inc.: *See*—
Laupot, Richard, 4,561,713, Cl. 339-74.00R.

X-Ten Corporation: *See*—
DeWitt, Nick; and Greene, Lindsey C., 4,561,671, Cl. 280-404.000.

Xerox Corporation: *See*—
Basch, Duane C., 4,561,763, Cl. 355-3.0DR.
Clausing, Don P., 4,561,644, Cl. 271-34.000.
Fox, Wayne D., 4,561,761, Cl. 355-3.00R.
Fox, Wayne D., 4,561,766, Cl. 355-15.000.
Lang, Joseph H., 4,561,756, Cl. 355-3.0SH.
Ong, Beng S.; Keoshkerian, Barkev; Murti, Dasarao K.; and Mammino, Joseph, 4,562,132, Cl. 430-59.000.
Salomon, James A.; and Weikel, Donald J., Jr., 4,561,757, Cl. 355-3.0BE.
Smith, Charles E., 4,561,772, Cl. 355-14.0SH.
Winnik, Francoise M.; and Martin, Trevor I., 4,562,135, Cl. 430-106.000.

Xomed Inc.: *See*—
Hunter, James D.; and Smith, James J., 4,561,540, Cl. 206-305.000.

Yachigo, Shinichi: *See*—
Takahashi, Yukoh; Terada, Yutaka; Yachigo, Shinichi; and Ishii, Tamaki, 4,562,281, Cl. 560-104.000.

Yagihashi, Shinichi: *See*—
Maeda, Yasuhiro; Yokoyama, Takashi; and Yagihashi, Shinichi, 4,561,486, Cl. 164-118.000.

Yairo, Osamu: *See*—
Hattori, Masayuki; Nakamura, Shigeo; and Yairo, Osamu, 4,562,361, Cl. 307-270.000.

Yamabe, Shigeru: *See*—
Micetich, Ronald G.; Yamabe, Shigeru; Tanaka, Motoaki; Kajitani, Makoto; Yamazaki, Tomio; and Ishida, Naobumi, 4,562,073, Cl. 424-114.000.

Yamada, Hideaki: *See*—
Shiozaki, Shozo; Yamada, Hideaki; Tani, Yoshiki; and Shimizu, Sakayu, 4,562,149, Cl. 435-88.000.

Yamada, Kazuo, to Togo Japan, Inc. Amusement vehicle. 4,561,514, Cl. 180-8.600.

Yamada, Koichi; Mouri, Masahide; and Nomura, Yoshisaburo, to Sumitomo Aluminium Smelting Company, Ltd. Method for manufacturing high-strength sintered silicon carbide articles. 4,562,040, Cl. 419-23.000.

Yamada, Minoru: *See*—
Okuda, Naoki; Yamada, Minoru; and Yoshino, Fumito, 4,561,888, Cl. 75-124.000.

Yamada, Muneki: *See*—
Maruhashi, Yoshitsugu; Kano, Fumio; Yamada, Muneki; and Hirata, Sadao, 4,562,118, Cl. 428-412.000.

Yamada, Osamu: *See*—
Shimano, Shizuo; Kobayashi, Shinichi; Yanagi, Mikio; Yamada, Osamu; Shida, Atsuhiko; and Futatsuya, Fumio, 4,561,880, Cl. 71-92.000.

Yamada, Tomiaki: *See*—
Watanabe, Keiichiro; Yamada, Tomiaki; Sazanami, Tsuneo; and Asahara, Eiko, 4,562,154, Cl. 435-162.000.

Yamaguchi, Isao; Sasamori, Yusuke; and Takaoka, Hideo, to Matsushita Electric Industrial Co., Ltd. Magnification changing device for copying machine. 4,561,770, Cl. 355-57.000.

Yamaguchi, Kimitoshi: *See*—
Inoue, Satoru; Uchida, Mitsuru; Yamaguchi, Kimitoshi; Aoki, Mitsuo; Tomita, Masami; and Uematsu, Chiaki, 4,562,136, Cl. 430-107.000.

Yamaguchi, Motoo; Sone, Isamu; Hirasawa, Kunio; Yoshioka, Yoshio; Nishikawa, Akio; Suzuki, Hiroshi; Sato, Mikio; and Hosokawa, Masao, to Hitachi, Ltd. SF_6 Gas arc extinguishing electric apparatus and process for producing the same. 4,562,322, Cl. 200-148.00G.

Yamaguchi, Motoo: *See*—
Shimizu, Toshio; Satou, Takanori; Tsukui, Tsutomu; Doi, Ryouta; and Yamaguchi, Motoo, 4,562,123, Cl. 429-27.000.

Yamaguchi, Takeshi: *See*—
Aoyagi, Yukio; Izumi, Eiki; Yamaguchi, Takeshi; and Tanaka, Sotaro, 4,561,250, Cl. 60-430.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Grinde, James E., 4,561,518, Cl. 180-215.000.

Yamaji, Kyoko: *See*—
Mochizuki, Kazuo; Nakakoji, Hisatada; Ichida, Toshio; Irie, Toshio; Ogata, Hajime; and Yamaji, Kyoko, 4,561,943, Cl. 204-28.000.

Yamamori, Teruo: *See*—
Adachi, Ikuo; Yamamori, Teruo; Ueda, Motohiko; and Doteuchi, Masami, 4,562,256, Cl. 546-120.000.

Yamamoto, Hisao; Kimura, Fumihiko; and Ogiso, Osamu, to Takemoto Yushi Kabushiki Kaisha. Lubricating agents for processing synthetic yarns and method of processing synthetic yarns therewith. 4,561,987, Cl. 252-8.900.

Yamamoto, Osamu; and Norizuki, Senichiro, to Kabushikikaisha Aichidenkikosakusho. Electric can opener. 4,561,182, Cl. 30-433.000.

Yamamoto, Ryoichi: *See*—
Wada, Takahiro; Yamamoto, Ryoichi; and Yokotani, Fumiko, 4,561,989, Cl. 252-70.000.

Yamamoto, Shinjiro; Yokoi, Shinji; Matsumoto, Keigo; Honda, Takeo; and Kobayashi, Takashi, to Sankyo Company Limited; and UBE Industries Ltd. B4-[2-(Di- or trisubstitutedphenoxy)ethyl amino]-thienodipyrimidines and insecticidal and acaricidal composition containing said pyrimidines. 4,562,193, Cl. 514-358.000.

Yamamoto, Takemasa: *See*—
Sasaki, Hirokazu; Morita, Akira; and Yamamoto, Takemasa, 4,561,944, Cl. 204-33.000.

Yamamoto, Takeshi; Sakata, Hideo; and Sugizaki, Iwao, to Mitutoyo Mfg. Co., Ltd. Two-directional touch sensor. 4,561,190, Cl. 33-561.000.

Yamamoto, Yoshihito: *See*—
Nishitani, Yoshihisa; Nakano, Masateru; and Yamamoto, Yoshihito, 4,562,493, Cl. 360-74.100.

Yamanaka, Hiroshi: *See*—
Mizumukai, Ken; Masamura, Tatuya; and Yamanaka, Hiroshi, 4,561,524, Cl. 188-319.000.

Yamanaka, Shoji: *See*—
Hottori, Makoto; and Yamanaka, Shoji, 4,562,056, Cl. 423-351.000.

Yamane, Hiroshi: *See*—
Nagashima, Masayoshi; and Yamane, Hiroshi, 4,562,444, Cl. 346-76.0PH.

Yamane, Noriomi; Arimatsu, Yoshikazu; Katsuo, Kenichi; Saitoh, Minoru; Tani, Katsya; Mitamura, Hideyuki; and Hiroyoshi, Kamatani, to Toyo Boseki Kabushiki Kaisha. Urethane polymers containing a tertiary nitrogen atom, and their production. 4,562,239, Cl. 528-65.000.

Yamanobe, Takashi; Mitsuishi, Yasushi; and Takasaki, Yoshiyuki, to Agency of Industrial Science and Technolgy; and Ministry of International Trade and Industry. Method for manufacture of cellulase. 4,562,150, Cl. 435-99.000.

Yamanouchi Pharmaceutical Co., Ltd.: *See*—
Hirata, Yasufumi; and Yanagisawa, Isao, 4,562,261, Cl. 548-184.000.

Yamasaki, Yasuaki: *See*—
Miyazaki, Haruo; Yamasaki, Yasuaki; and Oshiyama, Tsutomu, 4,562,164, Cl. 501-151.000.

Yamashiro, Hiroshi: *See*—
Sakata, Hideo; and Yamashiro, Hiroshi, 4,561,185, Cl. 33-164.00R.

Yamato Scale Company, Limited: *See*—
Sakakibara, Sakuichi; Tokuda, Yoshiaki; Nagai, Tamio; Mikata, Yoshitaka; and Nishide, Kazuhiro, 4,561,509, Cl. 177-25.000.

Yamato, Takashi: *See*—
Wakatsuka, Hirohisa; Yamato, Takashi; and Hashimoto, Shinsuke, 4,562,204, Cl. 514-530.000.

Yamauchi, Teruo: *See*—
Oyama, Yoshishige; Fujieda, Mamoru; and Yamauchi, Teruo, 4,561,403, Cl. 123-489.000.

Yamazaki, Shiro: *See*—
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizu, Susumu; Watanabe, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,561,877, Cl. 71-90.000.

Yamazaki, Tomio: *See*—
Micetich, Ronald G.; Yamabe, Shigeru; Tanaka, Motoaki; Kajitani, Makoto; Yamazaki, Tomio; and Ishida, Naobumi, 4,562,073, Cl. 424-114.000.

Yanadori, Michio; Miyamoto, Seigo; and Koike, Keiichi, to Hitachi, Ltd. Heat-storing apparatus. 4,561,493, Cl. 165-10.000.

Yanagi, Mikio: *See*—
Shimano, Shizuo; Kobayashi, Shinichi; Yanagi, Mikio; Yamada, Osamu; Shida, Atsuhiko; and Futatsuya, Fumio, 4,561,880, Cl. 71-92.000.

Yanagisawa, Akira; Yazawa, Hisashi; and Kato, Toshio, to Konishiroku Photo Industry Co., Ltd. Apparatus for and method of processing and packaging photographic film. 4,561,235, Cl. 53-411.000.

Yanagisawa, Isao: *See*—
Hirata, Yasufumi; and Yanagisawa, Isao, 4,562,261, Cl. 548-184.000.

Yanagishima, Fumiya: *See*—
Sunami, Hideo; Kuguminato, Hideo; Izumiyama, Yoshio; Yanagishima, Fumiya; Obara, Takashi; and Mochizuki, Kazuo, 4,561,909, Cl. 148-12.00D.

Yankopoulos, Basil: *See*—
Fulton, Scott; Yankopoulos, Basil; and Zediana, Lewis, Jr., 4,562,251, Cl. 536-17.400.

Yariv, Amnon; Harder, Christoph; and Lau, Kam-Yin, to California Institute of Technology. Tandem coupled cavity lasers with separate current control and high parasitic resistance between them for bistability and negative resistance characteristics and use thereof for optical disc readout. 4,562,569, Cl. 369-122.000.

Yarnell, James A., to Dana Corporation. Shift bracket assembly. 4,561,321, Cl. 74-473.00R.

Yasuda, Tomio: *See*—
Hashimoto, Akio; and Yasuda, Tomio, 4,561,515, Cl. 180-79.100.

Yasuda, Wataru: *See*—
Kaneko, Toshio; Sakamoto, Koji; Kanno, Fuchio; and Yasuda, Wataru, 4,561,381, Cl. 118-652.000.

Yasufuku, Yoshitaka: *See*—
Kikukawa, Shozo; and Yasufuku, Yoshitaka, 4,562,117, Cl. 428-407.000.

Yasukawa, Akira: *See*—
Nakajima, Tadakatsu; Nakayama, Wataru; Daikoku, Takahiro; Kuwahara, Heikichi; Yasukawa, Akira; Kasuya, Katsuhiko; Yokoi, Kazuaki; Nakae, Hideo; and Yoshida, Hiromichi, 4,561,497, Cl. 165-133.000.

Yazawa, Hisashi: *See*—
Yanagisawa, Akira; Yazawa, Hisashi; and Kato, Toshio, 4,561,235, Cl. 53-411.000.

Yazev, Vasily A.: *See*—
Kudinov, Gennady A.; Kasyanov, Grigory I.; Lysenko, Evgeny E.; Tolochko, Alexei I.; Yazev, Vasily A.; and Antonov, Vladimir M., 4,561,639, Cl. 266-193.000.

Yeager, Richard O.: *See*—
O'Rourke, David P.; and Yeager, Richard O., 4,562,411, Cl. 331-1.00A.

Yeda Research and Development Company Limited: *See*—
Natansohn, Almeria, 4,562,133, Cl. 430-80.000.

Yelnosky, John: *See*—
Kuhla, Donald E.; Studt, William L.; Campbell, Henry F.; and Yelnosky, John, 4,562,188, Cl. 514-245.000.

Yestadt, Frederick J.: *See*—
Yestadt, James F.; and Yestadt, Frederick J., 4,561,692, Cl. 297-93.000.

Yestadt, James F.; and Yestadt, Frederick J. Adjustable height furniture. 4,561,692, Cl. 297-93.000.

Yetter Manufacturing Company: *See*—
Williamson, Gerald E., 4,561,505, Cl. 172-776.000.

Yin, Ronald L. Display apparatus and method therefor. 4,562,461, Cl. 358-60.000.

Yokoe, Hifumi: *See*—
Kawamura, Norio; Yokoe, Hifumi; and Tsuda, Hideichi, 4,561,447, Cl. 128-687.000.

Yokohori, Nobuyuki. Apparatus for supporting baby toys. 4,561,549, Cl. 211-182.000.

Yokoi, Kazuaki: *See*—
Nakajima, Tadakatsu; Nakayama, Wataru; Daikoku, Takahiro; Kuwahara, Heikichi; Yasukawa, Akira; Kasuya, Katsuhiko; Yokoi, Kazuaki; Nakae, Hideo; and Yoshida, Hiromichi, 4,561,497, Cl. 165-133.000.

Yokoi, Shinji: *See*—
Yamamoto, Shinjiro; Yokoi, Shinji; Matsumoto, Keigo; Honda, Takeo; and Kobayashi, Takashi, 4,562,193, Cl. 514-358.000.

Yokotani, Fumiko: *See*—
Wada, Takahiro; Yamamoto, Ryoichi; and Yokotani, Fumiko, 4,561,989, Cl. 252-70.000.

Yokoyama, Takashi: *See*—
Maeda, Yasuhiro; Yokoyama, Takashi; and Yagihashi, Shinichi, 4,561,486, Cl. 164-118.000.

Yomtov, Barry M.: *See*—
Livingston, John H.; and Yomtov, Barry M., 4,561,444, Cl. 128-419.0PG.

Yonahara, Kunio; and Aimoto, Shingo, to Kabushiki Kaisha Meidensha. Electrically conductive plastic complex material. 4,562,113, Cl. 428-331.000.

Yonehana, Kiyoshi; and Tachibana, Zenpei, to Kawashima Textile Manufacturers Ltd.; and Kyocera Corporation. Double-pile loom. 4,561,473, Cl. 139-21.000.

Yonemochi, Osamu: *See*—
Usui, Masayoshi; and Yonemochi, Osamu, 4,561,484, Cl. 164-101.000.

Yonemura, Shigehiro: *See*—
Miyatake, Satoshi; Abe, Mitsuo; Kume, Masao; Yonemura, Shigehiro; and Umino, Hiroshi, 4,561,216, Cl. 51-165.920.

Yoon, Hyun-Nam, to Celanese Corporation. Process for forming thermally stable thermotropic liquid crystalline polyesters of predetermined chain length utilizing aliphatic dicarboxylic acid. 4,562,244, Cl. 528-190.000.

Yoshida, Akihiko: *See*—
Nishino, Atsushi; Yoshida, Akihiko; and Tanahashi, Ichiroh, 4,562,511, Cl. 361-324.000.

Yoshida, Hiromichi: *See*—
Nakajima, Tadakatsu; Nakayama, Wataru; Daikoku, Takahiro; Kuwahara, Heikichi; Yasukawa, Akira; Kasuya, Katsuhiko; Yokoi, Kazuaki; Nakae, Hideo; and Yoshida, Hiromichi, 4,561,497, Cl. 165-133.000.

Yoshida Kogyo K.K.: *See*—
Gartner, Karl, 4,561,225, Cl. 52-220.000.
Kaminaga, Hiromitsu, 4,561,228, Cl. 52-235.000.
Morita, Toyoo, 4,561,161, Cl. 29-408.000.
Ofusa, Masaatsu, 4,561,474, Cl. 139-384.00B.

Yoshida, Masashi: *See*—
Matsuno, Jyunichi; Kawauchi, Masataka; and Yoshida, Masashi, 4,562,443, Cl. 346-76.0PH.

Yoshida, Yoshitaro: *See*—
Kohno, Tsuguo; Yoshida, Yoshitaro; Tenjinbayashi, Koji; and Okazaki, Yuichi, 4,561,333, Cl. 82-1.00C.

Yoshii, Toshiya: *See*—
Otaki, Toshihiro; Nagata, Ryuichi; and Yoshii, Toshiya, 4,561,724, Cl. 350-334.000.

Yoshino, Fumito: *See*—
Okuda, Naoki; Yamada, Minoru; and Yoshino, Fumito, 4,561,888, Cl. 75-124.000.

Yoshino, Tetsuya: *See*—
Kishido, Takeshi; Yoshino, Tetsuya; Kageyama, Takashi; and Kato, Kazuo, 4,561,378, Cl. 118-62.000.

Yoshioka, Yoshio: *See*—
Yamaguchi, Motoo; Sone, Isamu; Hirasawa, Kunio; Yoshioka, Yoshio; Nishikawa, Akio; Suzuki, Hiroshi; Sato, Mikio; and Hosokawa, Masao, 4,562,322, Cl. 200-148.00G.

Yost, Donald A.: *See*—
Goff, Jerry K.; Marinko, Joseph A., Jr.; Venditto, Joseph G., Jr.; and Yost, Donald A., 4,562,386, Cl. 318-254.000.

Young, Alastair J.; Arrowsmith, David R.; and Parsons, David, to Automotive Products plc. Hydraulic slave cylinder with latch means for use with clutch release bearing. 4,561,531, Cl. 192-85.0CA.

Younge, Dale R.: *See*—
Harman, R. Keith; and Younge, Dale R., 4,562,428, Cl. 340-552.000.

Youngkeit, Dean, to Morton Thiokol, Inc. Apparatus for coating fiber materials with resin. 4,561,377, Cl. 118-33.000.

Younkin, Robert A.: *See*—
Gladden, Robert S., Jr.; Johnson, Richard J.; Kidd, John C.; and Younkin, Robert A., 4,561,232, Cl. 52-385.000.

Yugen-Gaisha Shiba Seisakusho: *See*—
Kumagai, Toji, 4,562,518, Cl. 362-249.000.

Yukamelamin Company, Limited: *See*—
Koeda, Kikuo; and Ito, Chikara, 4,562,050, Cl. 423-290.000.

Yurchenco, James R.: *See*—
Hovey, Dean A.; Grundstrom, Douglas R.; and Yurchenco, James R., 4,562,347, Cl. 250-221.000.

Zaderej, Andrew; and Zaderej, Andrew J. In-line solid state time delay device. 4,562,366, Cl. 307-599.000.

Zaderej, Andrew J.: *See*—
Zaderej, Andrew; and Zaderej, Andrew J., 4,562,366, Cl. 307-599.000.

Zado, Frank M., to AT&T Technologies, Inc. Soldering flux additive. 4,561,913, Cl. 148-23.000.

Zahner, John C.: *See*—
Owen, Hartley; Haddad, James H.; and Zahner, John C., 4,561,966, Cl. 208-11.00R.

Zaiko, Edward J.: *See*—
McDaniel, Roger L., Jr.; Portzer, Jeffrey W.; and Zaiko, Edward J., 4,562,260, Cl. 548-141.000.

Zaitu, Eizo, to Shinagawa Machinery Works Co., Ltd. Processor for continuously cooking grains. 4,561,347, Cl. 99-352.000.

Zalas, John M.: *See*—
Warnaka, Glenn E.; and Zalas, John M., 4,562,589, Cl. 381-71.000.

Zammuto, Samuel N., to Arachnid, Inc. Dart machine with electronic matrix. 4,561,660, Cl. 273-376.000.

Zandveld, Frederik; Schouten, Daniel; and van der Vliet, Peter C. L., to U.S. Philips Corporation. Data processing system having a control device for controlling an intermediate memory during a bulk data transport between a source device and a destination device. 4,562,534, Cl. 364-200.000.

Zarr, Myron: *See*—
Collins, Leslie M.; and Zarr, Myron, 4,561,609, Cl. 242-192.000.

Zediana, Lewis, Jr.: *See*—
Fulton, Scott; Yankopoulos, Basil; and Zediana, Lewis, Jr., 4,562,251, Cl. 536-17.400.

Zeigler, Theodore R. Stabilizing foot for an exhibit frame. 4,561,618, Cl. 248-166.000.

Zeilinger, Karl; and Bachschmid, Reiner, to Daimler-Benz Aktiengesellschaft. Seal of a cylinder head of an internal combustion engine. 4,561,634, Cl. 251-364.000.

Zeiner, Ronald N.: *See*—
Villa, Jose L.; and Zeiner, Ronald N., 4,561,986, Cl. 252-8.50A.

Zeren, Joseph D., to United States of America, Energy. Vacuum vapor deposition gun assembly. 4,561,382, Cl. 118-727.000.

Ziegler, Alfred, to Siemens Aktiengesellschaft. Circuit arrangement and method for fault locating in conjunction with equipment for the trunk feeding of electrical loads. 4,562,401, Cl. 324-52.000.

Zieke, Larry M.: *See*—
Behr, Raymond D.; and Zieke, Larry M., 4,562,027, Cl. 264-146.000.

Zimmer, Johannes: *See*—
Glantschnig, Josef; and Gugl, Peter, 4,561,354, Cl. 101-120.000.

Zimmerling, Dieter: *See*—
Schneider, Heinz-Walter; Kummer, Rudolf; and Zimmerling, Dieter, 4,561,942, Cl. 203-96.000.

Zimmerman, Edwin H. Woodworking machine and blades therefor. 4,561,477, Cl. 144-41.000.

Zimmerman, Harry. Fusing apparel seams. 4,561,128, Cl. 2-275.000.

Zimmerman, John M.; Krajewski, John J.; and Noren, Gerry K., to DeSoto, Inc. Hydroxyl-terminated polymers. 4,562,235, Cl. 526-304.000.

Zimmermann, Urs: *See*—
Mallen-Herrero, Jose ; Leroy, Daniel; Zimmermann, Urs; and Charlat, Patrice, 4,561,831, Cl. 418-28.000.

Zinetics Medical Technology Corporation: *See*—
Owen, Jeffrey D.; and Brown, Harold M., 4,561,963, Cl. 204-433.000.

Zinser Textilmaschinen GmbH: *See*—
Wolf, Horst, 4,562,388, Cl. 318-301.000.

Zoecon Corporation: *See*—
Lee, Shy-Fuh, 4,561,882, Cl. 71-94.000.

Zrnich, Milan, to GTE Communication Systems Corporation. Connector saver assembly. 4,561,711, Cl. 339-17.00C.

Zuber, Pierre A.; and Rogers, Mario, to Westinghouse Electric Corp. Vehicle speed control apparatus and method. 4,562,543, Cl. 364-426.000.

Zulauf, Karlheinz; and Egner, Rudolf, to Wella Aktiengesellschaft. Automatic locking device for a flexible container. 4,561,570, Cl. 222-153.000.

Zumsteg, Alphonse E.: *See*—
Sekler, Jorg; Zumsteg, Alphonse E.; and Hintermann, Hans Erich, 4,561,286, Cl. 73-23.000.

Zupanovich, John D.; and Myers, John G., to Calgon Corporation. Aqueous stable magnesium hydroxide suspensions which are dispersible in oil. 4,561,897, Cl. 106-14.140.

Zwiebel, Rudy P., to Magnetics International, Inc. Take-up apparatus. 4,561,538, Cl. 198-816.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 31ST DAY OF DECEMBER, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Beehive Machinery, Inc.: *See*—
McFarland, Archie R., Re. 32,060, Cl. 426-55.000.

Brunnschweiler, David; and Sedgely, Barrie. Weighing controlling flow rate with taring between weighings. Re. 32,058, Cl. 177-1.000.

LeVeen, Harry H. Radio frequency treatment of tumors while inducing hypotension. Re. 32,057, Cl. 128-804.000.

McFarland, Archie R., to Beehive Machinery, Inc. Process for producing deboned meat products. Re. 32,060, Cl. 426-55.000.

Nagano, Masashi, to Shimano Industrial Company Limited. Rear derailleur and control wire guide. Re. 32,059, Cl. 474-82.000.

Sedgely, Barrie: *See*—
Brunnschweiler, David; and Sedgely, Barrie, Re. 32,058, Cl. 177-1.000.

Shimano Industrial Company Limited: *See*—
Nagano, Masashi, Re. 32,059, Cl. 474-82.000.

LIST OF DESIGN PATENTEES

Abe, Karl H.; and Gevert, Klaus V., to Bayerische Motoren Werke A.G. Motorcycle. 281,962, 12-31-85, Cl. D12-110.000.

Allibert S.A.: *See*—
Deconinck, Didier, 281,933, Cl. D6-368.000.

Amano, Kazunori; and Sekigawa, Youichi, to Toshiba Heating Appliances Co., Ltd. Oilstove. 281,998, 12-31-85, Cl. D23-121.000.

Ambasz, Emilio; and Piretti, Giancarlo, to Center for Design Research and Development N.V. Combined seat and back unit. 281,941, 12-31-85, Cl. D6-502.000.

Amco Corporation: *See*—
Bentson, Wade A., 281,942, Cl. D7-43.000.

Arnold, William D.; and Bertram, Paul F., to Lee-Rowan Company. Combined tie and belt hanger. 281,931, 12-31-85, Cl. D6-317.000.

Artsana S.p.A.: *See*—
Catelli, Pietro, 281,987, Cl. D21-140.000.

Bakic, Dieter. Lipstick case. 282,015, 12-31-85, Cl. D28-86.000.

Balbuena, Arturo. Pendant. 281,959, 12-31-85, Cl. D11-81.000.

Bali Company: *See*—
Martini, Jeanne M., 281,924, Cl. D2-24.000.

Baum, Elliot I., to QT&T, Inc. Handset telephone. 281,972, 12-31-85, Cl. D14-53.000.

Bayerische Motoren Werke A.G.: *See*—
Abe, Karl H.; and Gevert, Klaus V., 281,962, Cl. D12-110.000.

Bentson, Wade A., to Amco Corporation. Hinged tortilla basket fryer. 281,942, 12-31-85, Cl. D7-43.000.

Bertram, Paul F.: *See*—
Arnold, William D.; and Bertram, Paul F., 281,931, Cl. D6-317.000.

Biosafety Systems, Inc.: *See*—
Gianni, Richard F., 282,009, Cl. D24-99.000.

Boeing Company, The: *See*—
Engfer, George J.; Kirk, Anthony I. C.; and Ostlund, Richard T., 281,930, Cl. D3-40.000.

Boyce, Raymond D. Portable blender. 281,945, 12-31-85, Cl. D7-378.000.

Boyd, Raymond. Foldable, lighted hand mirror. 282,014, 12-31-85, Cl. D6-309.000.

Braun, Michael. Chair. 281,934, 12-31-85, Cl. D6-371.000.

Brodrene Hartmann A/S: *See*—
Moller, Bent, 281,955, Cl. D9-341.000.

Brown, Craig F.: *See*—
Manno, Joseph J.; Davis, David L.; Busche, William W.; Conley, Richard B.; Mleczko, Robert; and Brown, Craig F., 282,002, Cl. D24-8.000.

Brown Group Recreational Products, Inc.: *See*—
Saxman, D. Scott; and Ziegler, William H., Jr., 281,992, Cl. D21-245.000.

Bulgari, Marina, to Marina B. Creation S.A. Necklace. 281,957, 12-31-85, Cl. D11-3.000.

Busche, William W.: *See*—
Manno, Joseph J.; Davis, David L.; Busche, William W.; Conley, Richard B.; Mleczko, Robert; and Brown, Craig F., 282,002, Cl. D24-8.000.

Butler, Robert F.: *See*—
Steventon, Arnold R.; and Butler, Robert F., 281,940, Cl. D6-492.000.

Cal-Tuf Glass Corporation: *See*—
Farmer, Gary L.; and Leuder, Donald E., 281,952, Cl. D8-394.000.

Carlson, Arthur R. Water level float for use in planters. 281,960, 12-31-85, Cl. D11-164.000.

Catelli, Pietro, to Artsana S.p.A. Toy bus. 281,987, 12-31-85, Cl. D21-140.000.

Cellini, Vito. Pistol machine gun or the like. 281,993, 12-31-85, Cl. D22-6.000.

Cendres et Metaux S.A.: *See*—
Wermuth, Walter, 282,003, Cl. D24-10.000.

Center for Design Research and Development N.V.: *See*—
Ambasz, Emilio; and Piretti, Giancarlo, 281,941, Cl. D6-502.000.

Cernansky, Joseph S.: *See*—
Rudell, Elliot A.; Shumate, Michael E.; and Cernansky, Joseph S., 281,964, Cl. D12-111.000.
Rudell, Elliot A.; Shumate, Michael E.; and Cernansky, Joseph S., 281,965, Cl. D12-113.000.

Chan, Ming K. Gas barbecue. 281,944, 12-31-85, Cl. D7-332.000.

Chestnut, M. Gaines. Aquarium gravel cleaner. 282,016, 12-31-85, Cl. D30-12.000.

Coats & Clark, Inc.: *See*—
Newman, Edward J., 281,953, Cl. D8-397.000.

Combi Co., Ltd.: *See*—
Nakao, Shinroku; Ishii, Yoshiyasu; and Ishige, Yukio, 281,984, Cl. D21-108.000.

Condair AG: *See*—
Muchenberger, Ernst, 282,001, Cl. D23-146.000.

Conley, Richard B.: *See*—
Manno, Joseph J.; Davis, David L.; Busche, William W.; Conley, Richard B.; Mleczko, Robert; and Brown, Craig F., 282,002, Cl. D24-8.000.

Danfoss A/S: *See*—
Moeller, Jorgen J., 281,969, Cl. D13-40.000.

Davis, David L.: *See*—
Manno, Joseph J.; Davis, David L.; Busche, William W.; Conley, Richard B.; Mleczko, Robert; and Brown, Craig F., 282,002, Cl. D24-8.000.

Deconinck, Didier, to Allibert S.A. Arm chair. 281,933, 12-31-85, Cl. D6-368.000.

DiVito, Fred, to Lumex, Inc. Raised toilet seat. 281,997, 12-31-85, Cl. D23-71.000.

Dorina Nahmaschinen GmbH, Firma: *See*—
Meier, Willi, 281,979, Cl. D15-69.000.

Enertronics, Inc.: *See*—
Thiele, Karl O.; and Taylor, Albert L., 281,968, Cl. D13-4.000.

Engfer, George J.; Kirk, Anthony I. C.; and Ostlund, Richard T., to Boeing Company, The. Vehicle overhead stowage bin unit or the like. 281,930, 12-31-85, Cl. D3-40.000.

ESPE Fabrik Pharmazeutischer Praeparate GmbH: *See*—
Neumeister, Alexander, 282,004, Cl. D24-10.000.

Etablissements Montaz Mautino: *See*—
Roc, Roland, 281,961, Cl. D12-52.000.

Fackert, James H. Gooseneck lamp. 282,011, 12-31-85, Cl. D26-62.000.

Farmer, Gary L.; and Leuder, Donald E., to Cal-Tuf Glass Corporation. Sheet glass connector. 281,952, 12-31-85, Cl. D8-394.000.

Ferenc, Robert A., to Whelen Engineering Company, Inc. Wide angle strobe light for emergency vehicles or the like. 282,010, 12-31-85, Cl. D26-28.000.

Finfrock, Dale B., Jr.: *See*—
LaMeyer, Michael H.; and Finfrock, Dale B., Jr., 281,951, Cl. D8-373.000.

Gamm, Robert J., to Kanagroos U.S.A., Inc. Boot with tongue pocket. 281,925, 12-31-85, Cl. D2-275.000.

Gevert, Klaus V.: *See*—
Abe, Karl H.; and Gevert, Klaus V., 281,962, Cl. D12-110.000.

Gianni, Richard F., to Biosafety Systems, Inc. Holder for medical waste disposal container. 282,009, 12-31-85, Cl. D24-99.000.

Grandy, Kenneth N.: *See*—
Hartmann, Udo; Stoller, Mark W.; and Grandy, Kenneth N., 281,949, Cl. D8-345.000.

Greco, Vincent. Latch for rolling gates. 281,947, 12-31-85, Cl. D8-331.000.

Haegele, John H.: *See*—
McKinney, James C., 282,007, Cl. D24-36.000.
Hammond, Gisela G. Book mark. 281,982, 12-31-85, Cl. D19-34.000.
Hartmann, Udo; Stoller, Mark W.; and Grandy, Kenneth N., to Master Lock Company. Hasp. 281,949, 12-31-85, Cl. D8-345.000.
Hashimoto, Masaki. Rim for bicycles. 281,967, 12-31-85, Cl. D12-208.000.
Hayes, Ronald G., to L. R. Nelson Corporation. Lawn sprinkler. 281,996, 12-31-85, Cl. D23-8.000.
Hesse, Klaus, to Sudhaus Schloss-und Beschlagtechnik GmbH & Co. Combination lock for luggage or similar articles. 281,948, 12-31-85, Cl. D8-338.000.
Hill, I. David, to Wolverine World Wide, Inc. Athletic shoe. 281,926, 12-31-85, Cl. D2-310.000.
Hill, I. David, to Wolverine World Wide, Inc. Athletic shoe. 281,927, 12-31-85, Cl. D2-310.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Watanabe, Masahiro, 281,963, Cl. D12-110.000.
Hug, James M., to Novi Products Company. Tub display stand. 281,939, 12-31-85, Cl. D6-449.000.
Imai, Hirotaka, to Pioneer Electronic Corporation. Digital audio disc player. 281,970, 12-31-85, Cl. D14-1.000.
Ishige, Yukio: *See*—
Nakao, Shinroku; Ishii, Yoshiyasu; and Ishige, Yukio, 281,984, Cl. D21-108.000.
Ishii, Yoshiyasu: *See*—
Nakao, Shinroku; Ishii, Yoshiyasu; and Ishige, Yukio, 281,984, Cl. D21-108.000.
IVAC Corporation: *See*—
Manno, Joseph J.; Davis, David L.; Busche, William W.; Conley, Richard B.; Mleczko, Robert; and Brown, Craig F., 282,002, Cl. D24-8.000.
Kanagroos U.S.A., Inc.: *See*—
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Kayhko, Kimmo, to Kone Oy. Specimen holder for photometric measurement of fluids in automatic analyzers. 282,005, 12-31-85, Cl. D24-29.000.
Kennedy, Bernard J., to Kennedy Houseboats, Inc. Boat chair. 281,936, 12-31-85, Cl. D6-380.000.
Kennedy Houseboats, Inc.: *See*—
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Kerschgens, Johann J. Hair-dryer. 282,013, 12-31-85, Cl. D28-13.000.
Kilham, Peter. Combined trough and perch for a bird feeder. 282,018, 12-31-85, Cl. D30-14.000.
Kilham, Peter. Bird feeder. 282,019, 12-31-85, Cl. D30-15.000.
Kirk, Anthony I. C.: *See*—
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Kirschling, Charles J.: *See*—
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Kone Oy: *See*—
Kayhko, Kimmo, 282,005, Cl. D24-29.000.
L. R. Nelson Corporation: *See*—
Hayes, Ronald G., 281,996, Cl. D23-8.000.
LaMeyer, Michael H.; and Finfrock, Dale B., Jr. Tank holder. 281,951, 12-31-85, Cl. D8-373.000.
Lancaster Colony Corporation: *See*—
Lockwood, James R., 281,966, Cl. D12-185.000.
Landstingens Inkopscentral, LIC, ekonomisk forening: *See*—
Marsh, Gunnar; and Olander, Christer, 282,006, Cl. D24-33.000.
Larsson, Bertil, to S & L Maskin Aktiebolag. Balance arm for supporting working tools. 281,980, 12-31-85, Cl. D15-138.000.
Lee-Rowan Company: *See*—
Arnold, William D.; and Bertram, Paul F., 281,931, Cl. D6-317.000.
Leuder, Donald E.: *See*—
Farmer, Gary L.; and Leuder, Donald E., 281,952, Cl. D8-394.000.
Lockwood, James R., to Lancaster Colony Corporation. Mud flap for trucks. 281,966, 12-31-85, Cl. D12-185.000.
Lowsky, Bernie. Chair. 281,935, 12-31-85, Cl. D6-373.000.
Lumex, Inc.: *See*—
DiVito, Fred, 281,997, Cl. D23-71.000.
Madl, Alfred W.; and Kirschling, Charles J., to Sunbeam Corporation. Air cleaner. 282,000, 12-31-85, Cl. D23-149.000.
Manno, Joseph J.; Davis, David L.; Busche, William W.; Conley, Richard B.; Mleczko, Robert; and Brown, Craig F., to IVAC Corporation. Intermittent medical delivery controller. 282,002, 12-31-85, Cl. D24-8.000.
Maples, G. Michael: *See*—
Parsons, Cynthia M.; and Maples, G. Michael, 281,978, Cl. D15-69.000.
Marina B. Creation S.A.: *See*—
Bulgari, Marina, 281,957, Cl. D11-3.000.
Marsh, Gunnar; and Olander, Christer, to Landstingens Inkopscentral, LIC, ekonomisk forening. Artificial leg. 282,006, 12-31-85, Cl. D24-33.000.
Martini, Jeanne M., to Bali Company. Brassiere. 281,924, 12-31-85, Cl. D2-24.000.
Master Lock Company: *See*—
Hartmann, Udo; Stoller, Mark W.; and Grandy, Kenneth N., 281,949, Cl. D8-345.000.
Masuda, Hitoshi: *See*—
Suzuki, Masataka; and Masuda, Hitoshi, 281,974, Cl. D14-68.000.
McFarlane, Richard H. Chamber base for catheter. 282,008, 12-31-85, Cl. D24-54.000.
McGuire, Thayard A. Push stick for a hoop. 281,990, 12-31-85, Cl. D21-210.000.
McKinney, James C., to Haegele, John H. Combined massager and back scratcher. 282,007, 12-31-85, Cl. D24-36.000.
Meelen, Hans T., to U.S. Philips Corporation. Lighting fixture. 282,012, 12-31-85, Cl. D26-63.000.
Meier, Willi, to Dorina Nahmaschinen GmbH, Firma. Sewing machine. 281,979, 12-31-85, Cl. D15-69.000.
Menei, Laurent. Stereo television receiver. 281,976, 12-31-85, Cl. D14-80.000.
Metrologic Instruments, Inc.: *See*—
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Meyer, Donald A., to Meyer's Manufacturing Corp. Mineral supplement feeder. 282,017, 12-31-85, Cl. D30-13.000.
Meyer's Manufacturing Corp.: *See*—
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Mleczko, Robert: *See*—
Manno, Joseph J.; Davis, David L.; Busche, William W.; Conley, Richard B.; Mleczko, Robert; and Brown, Craig F., 282,002, Cl. D24-8.000.
Moeller, Jorgen J., to Danfoss A/S. Casing for electrical apparatus or the like. 281,969, 12-31-85, Cl. D13-40.000.
Moller, Bent, to Brodrene Hartmann A/S. Egg tray. 281,955, 12-31-85, Cl. D9-341.000.
Muchenberger, Ernst, to Condair AG. Humidifier. 282,001, 12-31-85, Cl. D23-146.000.
Nakagawa Corporation: *See*—
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Nakao, Shinroku; Ishii, Yoshiyasu; and Ishige, Yukio, to Combi Co., Ltd. Toy block. 281,984, 12-31-85, Cl. D21-108.000.
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Neumeister, Alexander, to ESPE Fabrik Pharmazeutischer Praeparate GmbH. Irradiation device for dental substances. 282,004, 12-31-85, Cl. D24-10.000.
Newman, Edward J., to Coats & Clark, Inc. Nut. 281,953, 12-31-85, Cl. D8-397.000.
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Nicolino, James R.; and Nicolino, Harry R., 281,956, Cl. D10-26.000.
Nicolino, James R.; and Nicolino, Harry R. Clock. 281,956, 12-31-85, Cl. D10-26.000.
Nottingham, John R.; and Spirk, John W., Jr. Toy play house or similar article. 281,986, 12-31-85, Cl. D21-114.000.
Nottingham, John R.: *See*—
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Nuova Faema S.p.A.: *See*—
Rosalgino, Visconti, 281,943, Cl. D7-309.000.
Olander, Christer: *See*—
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Ostermiller, Terry E. We're number 1 cheering ornament or similar device. 281,928, 12-31-85, Cl. D3-5.000.
Ostlund, Richard T.: *See*—
Engfer, George J.; Kirk, Anthony I. C.; and Ostlund, Richard T., 281,930, Cl. D3-40.000.
Otake, Masao, to Nakagawa Corporation. Jewelry chain. 281,958, 12-31-85, Cl. D11-12.000.
Oyamada, Takashi, to NEC Corporation. Radio receiver. 281,975, 12-31-85, Cl. D14-70.000.
Parsons, Cynthia M.; and Maples, G. Michael. Smocking machine assembly. 281,978, 12-31-85, Cl. D15-69.000.
Paul, Bernard A. Telephone. 281,973, 12-31-85, Cl. D14-53.000.
Peavey, Hartley D. Guitar body or similar article. 281,981, 12-31-85, Cl. D17-20.000.
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Pipoly, Laraine. Novelty doll. 281,989, 12-31-85, Cl. D21-190.000.
Piretti, Giancarlo: *See*—
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QT&T, Inc.: *See*—
Baum, Elliot I., 281,972, Cl. D14-53.000.
Reichenstein, Kenneth, to Webcor Electronics, Inc. Combined handset telephone and interlocking cradle stand assembly. 281,971, 12-31-85, Cl. D14-53.000.
Roc, Roland, to Etablissements Montaz Mautino. Cable car cabin. 281,961, 12-31-85, Cl. D12-52.000.
Roczey, Edward L. Lap mounted adjustable tray. 281,937, 12-31-85, Cl. D6-406.000.
Rosalgino, Visconti, to Nuova Faema S.p.A. Espresso coffee machine. 281,943, 12-31-85, Cl. D7-309.000.
Rudell, Elliot A.; Shumate, Michael E.; and Cernansky, Joseph S., to Rudell, Elliot A. Bicycle for a child with a rider-simulating doll mounted thereon. 281,964, 12-31-85, Cl. D12-111.000.
Rudell, Elliot A.; Shumate, Michael E.; and Cernansky, Joseph S., to Rudell, Elliot A. Tricycle for a child with a rider-simulating doll mounted thereon. 281,965, 12-31-85, Cl. D12-113.000.
Rylander, Rex: *See*—
Vincent, James E.; and Rylander, Rex, 281,938, Cl. D6-429.000.
S & L Maskin Aktiebolag: *See*—
Larsson, Bertil, 281,980, Cl. D15-138.000.
Sachs, Isaac. Hook. 281,950, 12-31-85, Cl. D8-370.000.

Saxman, D. Scott; and Ziegler, William H., Jr., to Brown Group Recreational Products, Inc. Children's climber and swing support. 281,992, 12-31-85, Cl. D21-245.000.
Schmidt, Alvin D., to Woodstream Corporation. Fly trap. 281,995, 12-31-85, Cl. D22-19.000.
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ISSUED DECEMBER 31, 1985

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17 4,561,597
19 4,561,598
34 4,561,599

CLASS 242

18 DD 4,561,600
35.5 A 4,561,602
35.5 R 4,561,601
43 A 4,561,603
84.2 R 4,561,604
84.52 B 4,561,605
107 4,561,606
118.4 4,561,607
186 4,561,608
192 4,561,609
198 4,561,610

CLASS 244

3.16 4,561,611
104 R 4,561,612
134 A 4,561,613
173 4,561,614

CLASS 248

27.1 4,561,615
48.2 4,561,616
121 4,561,617
166 4,561,618
285 4,561,619
371 4,561,620
397 4,561,621
439 4,561,622
447 4,561,623
639 4,561,624

CLASS 249

85 4,561,625
118 4,561,626

CLASS 250

201 4,562,344
4,562,345
4,562,346
221 4,562,347
231 R 4,562,348
234 4,562,349
239 4,562,350
288 4,562,351
305 4,562,352
363 S 4,562,353
388 4,562,354
423 R 4,562,355
458.1 4,562,356

CLASS 251

11 4,561,627
30.01 4,561,628
65 4,561,629
84 4,561,630
129.15 4,561,632
129.20 4,561,631
339 4,561,633
364 4,561,634

CLASS 252

8.5 A 4,561,985
4,561,986
8.75 4,562,002
8.9 4,561,987
61 4,561,984
62.59 4,561,988
70 4,561,989
75 4,561,990
118 4,561,991
155 4,561,992
174.25 4,561,993
187.23 4,561,994
194 4,561,995
514 4,561,996
522 A 4,561,997
547 4,561,998
557 4,561,999
630 4,562,000
633 4,562,001

CLASS 254

26 R 4,561,635
29 R 4,561,636

CLASS 260

112 B 4,562,003
396 R 4,562,004
403 4,562,005
410 4,562,006
410.6 4,562,007
465.4 4,562,008
465.6 4,562,009
546 4,562,010
978 4,562,011

CLASS 261

44 C 4,562,012
50 B 4,562,013
64 R 4,562,014
94 4,562,015
106 4,562,016

CLASS 264

0.5 4,562,017
2.7 4,562,018
24 4,562,019
39 4,562,020
43 4,562,021
54 4,562,022
75 4,562,023
117 4,562,024
126 4,562,025
135 4,562,026
146 4,562,027
160 4,562,028
167 4,562,029
173 4,562,030
255 4,562,031
267 4,562,032
510 4,562,033

CLASS 266

81 4,561,637
158 4,561,638
193 4,561,639

CLASS 267

20 A 4,561,640
64.13 4,561,641

CLASS 269

21 4,561,642
43 4,561,643

CLASS 271

34 4,561,644
195 4,561,645
236 4,561,646
296 4,561,647

CLASS 272

73 4,561,648
96 4,561,649
105 4,561,650
117 4,561,651
119 4,561,652

CLASS 273

25 4,561,653
63 B 4,561,654
73 H 4,561,655
110 4,561,656
218 4,561,657
243 4,561,658
313 4,561,659
376 4,561,660
411 4,561,661

CLASS 277

229 4,561,662

CLASS 279

123 4,561,663

CLASS 280

18 4,561,664
20 4,561,665
4,561,666
47.13 B 4,561,667
226 R 4,561,668
276 4,561,669
281 R 4,561,670
404 4,561,671
618 4,561,672
629 4,561,673
655 4,561,674
734 4,561,675
801 4,561,676
804 4,561,677

CLASS 285

39 4,561,678
95 4,561,679
98 4,561,680
276 4,561,681
305 4,561,682
381 4,561,683

CLASS 292

150 4,561,684

CLASS 293

128 4,561,685

CLASS 294

64.1 4,561,686
4,561,687
4,561,688

CLASS 296

84 A 4,561,689
155 4,561,690
216 4,561,691

CLASS 297

93 4,561,692
306 4,561,693
379 4,561,694
452 4,561,695

CLASS 299

4 4,561,696
43 4,561,697
86 4,561,698

CLASS 303

24 F 4,561,699
36 4,561,700
119 4,561,701

CLASS 307

66 4,562,357
113 4,562,359
118 4,562,358
149 4,562,360
270 4,562,361
290 4,562,362
351 4,562,363
454 4,562,364
471 4,562,365
475 4,561,702
599 4,562,366

CLASS 308

6 C 4,561,703

CLASS 310

62 4,562,367
178 4,562,368
235 4,562,369
312 4,562,370
313 A 4,562,371
321 4,562,372
328 4,562,373
4,562,374
338 4,562,375

CLASS 312

222 4,561,704
244 4,561,705
258 4,561,706

CLASS 313

34 4,562,376
402 4,562,377
499 4,562,378
619 4,562,379

CLASS 315

4 4,562,380
99 4,562,381
209 CD 4,561,707
219 4,562,382
225 4,562,383
276 4,562,384

CLASS 318

135 4,562,385
254 4,562,386
285 4,562,387
301 4,562,388
432 4,562,389
490 4,562,390
568 4,562,391
572 4,562,392
599 4,562,393
608 4,562,394
696 4,562,395
809 4,562,396
814 4,562,397

CLASS 320

31 4,562,398

CLASS 322

94 4,562,399

CLASS 323

281 4,562,400

CLASS 324

52 4,562,401

CLASS 328

63 4,562,402

CLASS 329

103 4,562,403
118 4,562,404

CLASS 330

51 4,562,405
85 4,562,406
129 4,562,407
253 4,562,408
286 4,562,409

CLASS 331

1 A 4,562,410
4,562,411
53 4,562,412
116 R 4,562,413

CLASS 332

9 R 4,562,414
4,562,415

CLASS 333

26 4,562,416
165 4,562,417

CLASS 335

131 4,562,418
195 4,562,419

CLASS 337

165 4,562,420

CLASS 339

14 L 4,561,708
17 C 4,561,711
17 F 4,561,709
17 M 4,561,710
33 4,561,712
74 R 4,561,713
97 P 4,561,714
103 R 4,561,715
177 R 4,561,716

CLASS 340

52 A 4,562,421
347 DD 4,562,422
4,562,423
4,562,425
4,562,426
347 NT 4,562,424
552 4,562,428
604 4,562,431
657 4,562,429
706 4,562,432
716 4,562,433
771 4,562,450
775 4,562,434
798 4,562,435
825 4,562,436
825.5 4,562,427
870.37 4,562,430

CLASS 343

17.1 R 4,562,438
4,562,439
394 4,562,437
703 4,562,440
781 P 4,562,441

CLASS 346

75 4,562,442
76 PH 4,562,443
4,562,444
140 R 4,562,445
4,562,446
159 4,562,447
208 4,562,448
218 4,562,449

CLASS 350

6.8 4,561,717
96.14 4,561,718
96.21 4,561,719
128 4,561,720
162.17 4,561,721
171 4,561,722
331 R 4,561,723
334 4,561,724
341 4,561,725
4,561,726
351 4,561,727
356 4,561,728
357 4,561,729
432 4,561,730
510 4,561,731
584 4,561,732
618 4,561,733

CLASS 351

103 4,561,734
153 4,561,735
159 4,561,736
160 R 4,561,737
226 4,561,738
227 4,561,739

CLASS 353

101 4,561,740

CLASS 354

21 4,561,741
86 4,561,742
121 4,561,743
234.1 4,561,744
299 4,561,745
400 4,561,746
402 4,561,747
403 4,561,748
406 4,561,749
4,561,750
418 4,561,751
432 4,561,752
4,561,753
484 4,561,754

CLASS 355

3 BE 4,561,757
3 DD 4,561,759
3 DR 4,561,763
3 R 4,561,760
4,561,761
4,561,762
3 SH 4,561,755
4,561,756
8 4,561,758
4,561,764
14 R 4,561,771
14 SH 4,561,765
4,561,772
15 4,561,766
26 4,561,767
38 4,561,768
43 4,561,773
45 4,561,769
57 4,561,770
75 4,561,774

CLASS 356

5 4,561,775
72 4,561,776
318 4,561,777
350 4,561,780
387 4,561,778
442 4,561,779

CLASS 357

13 4,562,451
24 4,562,452
44 4,562,453
51 4,562,454
71 4,562,455

CLASS 358

13 4,562,456
19 4,562,457
21 R 4,562,458
27 4,562,459
28 4,562,460
60 4,562,461
75 4,562,462
88 4,562,463
111 4,562,464
120 4,562,465
133 4,562,466
135 4,562,467
136 4,562,468
139 4,562,469
167 4,562,470
172 4,562,471
197 4,562,472
213 4,562,473
4,562,474
228 4,562,475
4,562,476
4,562,477
236 4,562,478
243 4,562,479
248 4,562,480
252 4,562,481
254 4,562,482
257 4,562,483
261 4,562,484
280 4,562,485
282 4,562,486
342 4,562,487

CLASS 360

8 4,562,488
39 4,562,489
44 4,562,490
51 4,562,491
65 4,562,492
74.1 4,562,493
75 4,562,494
78 4,562,495
85 4,562,496
96.3 4,562,497
97 4,562,498
98 4,562,499
105 4,562,500
109 4,562,501
114 4,562,502
123 4,562,503
133 4,562,504
135 4,562,505

CLASS 361

71 4,562,506
85 4,562,507
91 4,562,508
104 4,562,509
212 4,562,510
324 4,562,511
386 4,562,512
409 4,562,513
433 4,562,514

CLASS 362

33 4,562,515
78 4,562,516
147 4,562,517
249 4,562,518
308 4,562,519
414 4,562,520
433 4,562,521

CLASS 363

21 4,562,522
4,562,523
41 4,562,524
45 4,562,525
61 4,562,526
89 4,562,527

CLASS 364

133 4,562,528
140 4,562,529
148 4,562,530
164 4,562,531
200 4,562,532
4,562,533
4,562,534
4,562,535
4,562,536
4,562,537
4,562,538
4,562,539
400 4,562,540
424.1 4,562,541
426 4,562,542
4,562,543
431.11 4,562,544
431.12 4,562,545
434 4,562,546
483 4,562,548
484 4,562,547
486 4,562,549
492 4,562,550
510 4,562,552
513 4,562,551
745 4,562,553
900 4,562,554

CLASS 365

233 4,562,555

CLASS 366

132 4,561,781
349 4,561,782

CLASS 367

26 4,562,556
27 4,562,557
68 4,562,558
82 4,562,559
83 4,562,560
139 4,562,561

CLASS 368

309 4,561,783

CLASS 369

32 4,562,562
44 4,562,564
4,562,565
75.2 4,562,566
79 4,562,563
106 4,562,567
112 4,562,568
122 4,562,569
270 4,562,570

CLASS 370

7 4,562,571
80 4,562,572
85 4,562,573
100 4,562,574

CLASS 371

9 4,562,575
21 4,562,576
38 4,562,577
40 4,562,578

CLASS 372

26 4,562,579
69 4,562,580

CLASS 374

8 4,561,784
42 4,561,785
129 4,561,786

CLASS 375

7 4,562,581
87 4,562,582

CLASS 376

172 4,562,034
215 4,562,035
283 4,562,036
340 4,562,037
353 4,562,038

CLASS 378

43 4,562,583
54 4,562,584
83 4,562,585
108 4,562,586
133 4,562,587
208 4,562,588

CLASS 381

71 4,562,589
90 4,562,590
106 4,562,591

CLASS 382

3 4,562,592
6 4,562,593
9 4,562,594

CLASS 384

295 4,561,787
513 4,561,788

CLASS 400

120 4,561,789
124 4,561,790
208 4,561,791
618 4,561,792
697.1 4,561,793

CLASS 402

75 4,561,794

CLASS 403

4 4,561,795
4,561,796
58 4,561,797
109 4,561,798
285 4,561,799

CLASS 404

79 4,561,800

CLASS 405

15 4,561,801
195 4,561,802
224 4,561,803
262 4,561,804

CLASS 406

71 4,561,805
88 4,561,806
99 4,561,807
118 4,561,808

CLASS 407

114 4,561,809
118 4,561,810

CLASS 408

1 R 4,561,811
225 4,561,812
230 4,561,813

CLASS 409

80 4,561,814
227 4,561,815

CLASS 414

4 4,561,816
119 4,561,817
301 4,561,818
331 4,561,819
4,561,820
332 4,561,821
422 4,561,822
678 4,561,823
697 4,561,824
753 4,561,825

CLASS 416

19 4,561,826

CLASS 417

223 4,561,827
307 4,561,828
368 4,561,829
474 4,561,830

CLASS 418

28 4,561,831
55 4,561,832
61 B 4,561,833
150 4,561,834
173 4,561,835
183 4,561,836
255 4,561,837

CLASS 419

2 4,562,039
23 4,562,040
40 4,562,041

CLASS 422

13 4,562,042
56 4,562,043
64 4,562,044
102 4,562,045
140 4,562,046
300 4,562,047

CLASS 423

81 4,562,048
82 4,562,049
219 4,562,051
235 4,562,052
4,562,053
244 4,562,054
290 4,562,050
329 4,562,055
351 4,562,056
409 4,562,057
551 4,562,058
626 4,562,059

CLASS 424

28 4,562,060
32 4,562,061
45 4,562,062
49 4,562,063
4,562,064
4,562,065
52 4,562,066
59 4,562,067
70 4,562,068
80 4,562,069
92 4,562,070
94 4,562,071
101 4,562,072
114 4,562,073

CLASS 425

387.1 4,561,838

CLASS 426

5 4,562,076
13 4,562,077
52 4,562,078
55 Re.32,060
94 4,562,079
4,562,080
101 4,562,081
104 4,562,082
424 4,562,083
502 4,562,084
577 4,562,085
578 4,562,086
599 4,562,087

CLASS 427

8 4,562,088
10 4,562,089
34 4,562,090
41 4,562,091
58 4,562,092
109 4,562,093
115 4,562,094
180 4,562,095
208.8 4,562,096
209 4,562,097
282 4,562,099
341 4,562,098
385.5 4,562,100

CLASS 428

36 4,562,101
43 4,562,102
76 4,562,103
148 4,562,104
161 4,562,105
195 4,562,106
196 4,562,107
212 4,562,108
220 4,562,109
284 4,562,110
289 4,562,111
318.6 4,562,112
331 4,562,113
372 4,562,114
392 4,562,115
402.21 4,562,116
407 4,562,117
412 4,562,118
458 4,562,119
469 4,562,120
607 4,562,121
644 4,562,122

CLASS 429

27 4,562,123
30 4,562,124
65 4,562,125
72 4,562,126
89 4,562,127
178 4,562,128

CLASS 430

42 4,562,129
54 4,562,130
58 4,562,131
59 4,562,132
80 4,562,133
83 4,562,134
106 4,562,135
107 4,562,136
138 4,562,137
219 4,562,138
223 4,562,139
244 4,562,140
281 4,562,141
288 4,562,142
353 4,562,143
372 4,562,144
538 4,562,145
546 4,562,146

CLASS 431

6 4,561,839
22 4,561,840
265 4,561,841

CLASS 432

106 4,561,842
214 4,561,843

CLASS 433

14 4,561,844
29 4,561,845
73 4,561,846
182 4,561,847

CLASS 434

18 4,561,848
22 4,561,849
98 4,561,850
272 4,561,851
339 4,561,852

CLASS 435

5 4,562,147
7 4,562,148
88 4,562,149
99 4,562,150
108 4,562,151
116 4,562,152
4,562,153
162 4,562,154
172.3 4,562,155
253 4,562,156
291 4,562,157

CLASS 436

57 4,562,158
501 4,562,159
539 4,562,160

CLASS 441

106 4,561,853

CLASS 446

304 4,561,854

CLASS 455

345 4,562,595

CLASS 464

47 4,561,855

CLASS 474

82 Re.32,059

CLASS 501

59 4,562,161
60 4,562,162
96 4,562,163
151 4,562,164

CLASS 502

33 4,562,165
62 4,562,166
100 4,562,167
107 4,562,168
4,562,169
113 4,562,170
117 4,562,171
4,562,172
127 4,562,173
174 4,562,174

CLASS 514

12 4,562,175
17 4,562,176
34 4,562,177
59 4,562,178
77 4,562,179
114 4,562,180
202 4,562,181
210 4,562,182
214 4,562,183
222 4,562,184
229 4,562,185
238 4,562,186
4,562,187
245 4,562,188
252 4,562,189
254 4,562,190
255 4,562,191
258 4,562,192
264 4,562,194
294 4,562,195
332 4,562,196
343 4,562,197
358 4,562,193
383 4,562,198
399 4,562,199
415 4,562,200
422 4,562,201
423 4,562,202
468 4,562,203
530 4,562,204
546 4,562,205
548 4,562,206
573 4,562,207
593 4,562,208
596 4,562,209
604 4,562,210
648 4,562,211
690 4,562,212
721 4,562,213
788 4,562,075
844 4,562,214

CLASS 522

33 4,561,951
91 4,561,950

CLASSIFICATION OF PATENTS

CLASS 523

220	4,562,215
433	4,562,216
466	4,562,217

CLASS 524

15	4,562,218
91	4,562,219
95	4,562,220
456	4,562,221
505	4,562,222
506	4,562,223
519	4,562,224
602	4,562,225
767	4,562,226
786	4,562,227

CLASS 525

66	4,562,228
71	4,562,229
74	4,562,230
189	4,562,231
444.5	4,562,232

CLASS 526

76	4,562,233
241	4,562,234
304	4,562,235

CLASS 527

400	4,562,236

CLASS 528

17	4,562,237
18	4,562,238
65	4,562,239
73	4,562,240
99	4,562,241
174	4,562,243
190	4,562,244
193	4,562,242
361	4,562,245
423	4,562,246

CLASS 534

605	4,562,247
630	4,562,248
641	4,562,249

CLASS 536

6	4,562,250
17.4	4,562,251
114	4,562,252

CLASS 544

19	4,562,253
92	4,562,254
357	4,562,255

CLASS 546

120	4,562,256
169	4,562,257
281	4,562,258

CLASS 548

112	4,562,259
141	4,562,260
184	4,562,261
257	4,562,262
479	4,562,263

CLASS 549

58	4,562,267
259	4,562,268
	4,562,269
261	4,562,264
294	4,562,270
310	4,562,271
352	4,562,272
364	4,562,265
462	4,562,266
473	4,562,273
525	4,562,274

CLASS 556

7	4,562,275
20	4,562,276
34	4,562,277
418	4,562,278

CLASS 560

12	4,562,279
103	4,562,280
104	4,562,281
184	4,562,282
204	4,562,283

CLASS 562

406	4,562,284
414	4,562,285
467	4,562,286
492	4,562,287
608	4,562,288

CLASS 564

2	4,562,289
399	4,562,290
463	4,562,291

CLASS 568

043	4,562,292
347	4,562,293
362	4,562,294
366	4,562,295
388	4,562,296
432	4,562,297
644	4,562,298
811	4,562,299

CLASS 585

854	4,562,300

CLASS 604

143	4,561,856
174	4,561,857
336	4,561,858

CLASS 623

2	4,561,129

CLASSIFICATION OF DESIGNS

D2—	24	281,924
	275	281,925
	310	281,926
		281,927
D3—	5	281,928
	39	281,929
	40	281,930
D6—	309	282,014
	317	281,931
	354	281,932
	368	281,933
	371	281,934
	373	281,935
	380	281,936
	406	281,937
	429	281,938
	449	281,939
	492	281,940
	502	281,941
D7—	43	281,942
	309	281,943
	332	281,944
	378	281,945
D8—	38	281,946
	331	281,947
	338	281,948
	345	281,949
	370	281,950
	373	281,951
	394	281,952
	397	281,953
D9—	322	281,954
	341	281,955
D10—	26	281,956
D11—	3	281,957
	12	281,958
	81	281,959
	164	281,960
D12—	52	281,961
	110	281,962
		281,963
	111	281,964
	113	281,965
	185	281,966
	208	281,967
D13—	4	281,968
	40	281,969
D14—	1	281,970
	53	281,971
		281,972
		281,973
	68	281,974
	70	281,975
	80	281,976
	116	281,977
D15—	69	281,978
		281,979
	138	281,980
D17—	20	281,981
D19—	34	281,982
	61	281,983
D21—	108	281,984
	109	281,985
	114	281,986
	140	281,987
	184	281,988
	190	281,989
	210	281,990
	222	281,991
	245	281,992
D22—	6	281,993
	19	281,995
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